- Forgone economic impacts for the airport and the regional and national economies

3.2.4 Constrained Traffic Impacts at Dublin Airport

The Mott MacDonald study simulated the slot coordination process to create constrained busy day schedules from 2022 (representing when the North Runway is likely to be operational) to 2025 (when the 32m passenger level is assumed to be reached). It modelled the impact of the North Runway operating restrictions (Conditions 3d and 5) and overall runway capacity (operating in compliance with the planning conditions) on airline schedules, taking into account the impacts on aircraft rotations throughout the day.

The assessed impact is a loss of air traffic movements and associated loss in 1.1m passengers per year (-3.5%) and a cumulative loss over the 4-year period 2022-2025 of 4.3m passengers. It should be noted that this estimated impact is a conservative assessment. It assumes that airlines are willing and able to accept alternative slot times outside of the 23:00-07:00 night period, which would be commercially and/or operationally suboptimal. In a post COVID crisis environment, weak passenger demand will mean that airline flexibility is reduced.

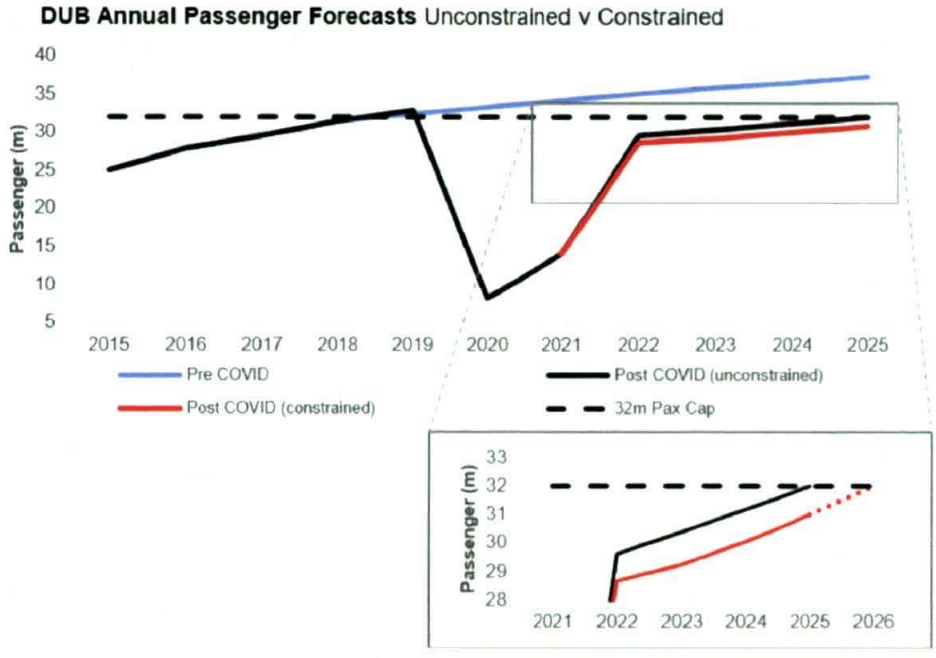


Figure 3-3 Annual Traffic Impact Summary (millions of passengers) (Mott McDonald, 2020)

Dublin Airport is the busiest airport in the Republic of Ireland. In 2018, the airport welcomed 44 airlines which offered scheduled and charter service to over 180 destinations in 40 countries on four continents, and in 2019 the airport welcomed 47 airlines and flights to over 200 destinations. The airport has two main airlines providing the majority of flights: Ryanair (35% share) and Aer Lingus (29% share), based on the Summer 2019 schedule. The airport serves mostly short haul services (90% of flights) to points in the UK and Europe. Long haul services are mainly to North America, plus some services to the Middle East, Asia and Africa.

The night restrictions would slow growth in long haul services for two reasons:

- Many long-haul routes require early morning arrivals in the night restrictions period
- Retiming of flights to avoid the night restrictions period would reduce flight connection possibilities, making some new long-haul services unviable without enough connecting feed traffic.

3.2.5 Implications for Irish National Aviation Policy

The Department of Transport, Tourism and Sport (DTTAS) published a National Aviation Policy (NAP) for Ireland in August 2015. The principal goals of the NAP are:

- Enhance Ireland's connectivity – respond to the needs of businesses, tourism and consumers through safe, secure and competitive access;

- Foster growth of aviation enterprise – support employment in the sector and maintain Ireland's strong tradition and reputation in aviation; and
- Maximise economic contribution of aviation sector – commit to maximising the benefits of aviation to Ireland's economic growth and development.

With regard to the second runway at Dublin Airport, the NAP specifically states that:

> "*The process to develop the second runway at Dublin Airport will commence, to ensure the infrastructure necessary for the airport's position as a secondary hub and operate to global markets without weight restrictions is available when needed*".
>
> (A National Aviation Policy for Ireland, August 2015, Action 4.5.1, page 50).

Results from the assessment carried out by InterVISTAS (discussed further below) found the operating restrictions on passenger traffic and air services at Dublin Airport, which come into force when the North Runway is fully operational, will contradict the aims and commitments of the NAP. The negative effects on both long haul and short haul flights in the constrained schedule will reduce the connectivity and competitiveness of Dublin Airport.

The assessment concluded that, consequently, the decreased traffic and air services result in a reduced economic contribution to the national economy, as documented in Section 3.2.6 below.

3.2.6 Forgone Economic Impacts

As noted earlier, daa appointed InterVISTAS to conduct a study (October 2020) on the overall economic impact of the restrictions on permitted operations, building on work completed by Mott McDonald to assess and quantify the overall traffic impacts of the operating restrictions at Dublin Airport. In its analysis, InterVISTAS considered four distinct categories:

- Direct Economic Impact. The employment, income and economic output associated with the operation and management of activities at the airport including firms on-site at the airport and airport-related businesses located elsewhere near the airport.
- Indirect Economic Impact. The employment, income and economic output generated by industries that supply and support the activities at the airport, such as food wholesalers, fuel refiners, etc.
- Induced Economic Impact. This captures the economic activity generated by the employees of firms directly or indirectly connected to the airport spending their income in the national economy.
- Catalytic Impacts. These capture the way in which the airport facilitates the business of other sectors of the economy. As such, air transportation facilitates employment and economic development in the national economy by facilitating trade, tourism, investment and productivity growth.

The forgone economic impact of the permitted / constrained scenario (the North Runway Permission) in 2022and 2025 are presented in Figure 3-4. The analysis suggests that as a result of the operating restrictions, the Irish economy could forgo an additional 3,430 jobs and €262 million in GVA by 2025, relative to proposed Relevant Action. The majority of this forgone economic impact is expected to occur outside of the aviation sector: 62% of the total impact is catalytic impacts (tourism, trade, investment, etc.) and another 21% are indirect and induced impacts (supplier and spending in the wider economy).

Impact	Number of Jobs	Full-Time Equivalents (FTEs)	Wages (€ Millions)	GVA (€ Millions)
2022 Impact				
Direct	440	390	18	36
Indirect	250	220	10	20
Induced	310	270	11	21
Catalytic	1,810	1,600	69	136
Total	**2,810**	**2,480**	**108**	**213**
2023 Impact				
Direct	540	480	22	45
Indirect	300	270	13	24
Induced	380	330	13	26
Catalytic	1,910	1,690	73	143
Total	**3,130**	**2,770**	**121**	**238**
2024 Impact				
Direct	550	490	23	46
Indirect	330	290	14	26
Induced	390	340	13	27
Catalytic	2,030	1,790	77	151
Total	**3,300**	**2,910**	**127**	**250**
2025 Impact				
Direct	580	520	24	49
Indirect	340	300	14	27
Induced	400	360	14	28
Catalytic	2,110	1,860	81	158
Total	**3,430**	**3,040**	**133**	**262**

All financial figures are in 2020 prices.
Numbers may not add up due to rounding.

Figure 3-4 Foregone Economic Impact resulting from Operating Restrictions

3.3 Patterns of Demand

The analyses of the InterVISTAS study are based on unconstrained forecast busy day schedules. The forecast schedules represent expected traffic in 2022 (shortly after the opening of the new North Runway) and in each year to 2025, when traffic is expected to reach 32m annual passengers again after the COVID-19 traffic disruption.

This pattern of demand provides improved connectivity for the development of Dublin Airport, as well as providing for efficient point-to-point short haul services.

Permitted schedules are constrained by the airport's single runway capacity. With the opening of the North Runway, a greater pattern of demand is expected in the peak 06:00 departures hour (reflecting airlines' commercially and operationally ideal operating times).

Meeting this level of departures demand in the 06:00 hour requires use of the North Runway in the 06:00-06:59 hour.

3.3.1 Current Night Movements

In Summer 2019, there were 113 regularly scheduled flights during the 23:00-07:00 period. Short haul scheduled services make up the bulk of these night flights, with departures between 06:00-07:00 and arrivals after 23:00. There are 17 long haul night arrivals in the early morning. The night cargo operations are primarily flights by the package integrators DHL, FedEx, TNT and UPS operating to their main sortation hubs. These operations are very time-critical in order to connect at these hubs and to achieve an overnight package delivery service.

3.3.2 Future Night Movement Demand

Busy day night movements are expected to decrease slightly with the post COVID-19 traffic downturn, but recover to pre-COVID-19 levels by the time Dublin reaches 32m annual passenger throughput again in 2025. In the Mott McDonald forecast, by 2022, Dublin aircraft movements are assumed to have recovered to 95% of 2019 levels, although passengers have only recovered to around 90% due to reduced load factors and aircraft size in the post COVID recovery period. According to the Mott McDonald Report aircraft movements are forecast to recover fully to 2019 levels by 2025. Night movement demand is reduced in 2022 (compared with 2019) and recovers in line with Dublin aircraft movements.

3.3.3 Summary of Schedule Adjustments

Figure 3-4 and Figure 3-5 below provide a summary of the required schedule adjustments for 2025, when traffic is assumed to return to the 32m annual passenger level.

The reasons for schedule adjustments are detailed in the table below. The primary reason for timing adjustment was the night operating restriction and the knock-on impacts on aircraft rotations, with the volume of such adjustments increasing during the forecast period 2022-2025 as unconstrained demand grows. There are also a number of flights removed from the schedule ('no slots') due to the night constraints and knock-on rotational issues.

Slot Allocation Summary
(excl GA flights)

	2025 (32m)	Summary
Cleared OK	525	*70.9%*
Retimed due night	36	*4.9%*
Retimed due a/c rotations	121	*16.4%*
Runway 10min limit	22	*3.0%*
Runway 60min limit	12	*1.6%*
Allocated sub total	**716**	***96.8%***
No slot due Night	12	*1.6%*
No slot due to a/c rotation	12	*1.6%*
Total	**740**	***100.0%***

Note: A 'no slot' flight is a flight in the unconstrained demand forecast schedule that cannot be accommodated within the airport's operational constraints, and is thus removed from the constrained forecast schedule.

Figure 3-5 Site Allocation Summary

Timing Adjustment Summary (of flights with slot allocated)

	2025 (32m)
Cleared OK	73.6%
±5 min	2.4%
±10 min	3.8%
±15 min	2.2%
±20-30 min	8.5%
±35-60 min	5.9%
more than ±60 min	3.6%

Figure 3-6 Timing Adjustment Summary (of flights with slot allocated

3.3.4 Conclusion of the need for the project

The proposed Relevant Action relates to the night-time use of the runway system at Dublin Airport. It involves the amendment of the operating restriction set out in condition no. 3(d) and the replacement of the operating restriction in condition no. 5 of the North Runway Planning Permission, as well as proposing new noise mitigation measures. Conditions no. 3(d) and 5 have not yet come into effect or operation, as the construction of the North Runway on foot of the North Runway Planning Permission is ongoing.

The proposed relevant action does not seek any amendment of conditions of the North Runway Planning Permission governing the general operation of the runway system (i.e., conditions which are not specific to night-time use, namely conditions no. 3 (a), 3(b), 3(c) and 4 of the North Runway Planning Permission) or any amendment of permitted annual passenger capacity of the Terminals at Dublin Airport. Condition no. 3 of the Terminal 2 Planning Permission (Fingal County Council Reg. Ref. No. F04A/1755; ABP Ref. No. PL06F.220670) and condition no. 2 of the Terminal 1 Extension Planning Permission (Fingal County Council Reg. Ref. No. F06A/1843; ABP Ref. No. PL06F.223469) provide that the combined capacity of Terminal 1 and Terminal 2 together shall not exceed 32 million passengers per annum.

The result of the permitted / constrained scenario coming into effect when North Runway becomes operational in 2022, is a loss of air traffic movements and associated loss of 1.1m passengers per year (-3.5%) and a cumulative loss over the 4-year period 2022-2025 of 4.3m passengers. The net effect of the proposed Relevant Action would be to facilitate an increase in the number of flights permitted to take off from, or land at, Dublin Airport at night, which would enable the lost 1.1million passengers to be regained annually in the post-COVID-19 recovery period.

In short, the proposed Relevant Action is required to amend two operating restriction which will come into force once North Runway becomes operational, to enable Dublin Airport to facilitate growth back to pre-COVID-19 levels of operation.

Chapter 04: Examination of Alternatives

04

4. Examination of Alternatives

4.1 Introduction

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 which amends Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment states an EIAR should contain:

'*A description of the reasonable alternatives (for example in term of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.*'

This section outlines the main alternatives considered for the proposed Relevant Action to meet the identified needs outlined in EIAR Chapter 3: Background and Need for the Project. It then gives the main reasons why the final proposal was chosen.

It is important to note that the proposed Relevant Action application relates only to change in operating restrictions, and does not comprise the delivery of any physical infrastructure or construction works Therefore, this EIAR chapter only considers alternatives to the operation of the North Runway and wider runway system.

4.2 Legislative Context

The 2014 EIA Directive was transposed into domestic Irish law on the 1st September 2018 in the form of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (hereafter referred to as 'the EIA Regulations').

4.3 Methodology

As mentioned above in *Section 4.1: Introduction,* the EU Directive 2014/52/EU requires the EIAR to provide an assessment of the reasonable alternatives considered. This chapter meets this requirement through the use of the EPA's draft 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2017) (hereafter referred to as 'the EPA Draft Guidelines') which outlines different types of alternative that should be considered in an EIAR. These include:

- Do nothing scenario;
- Alternative locations;
- Alternative layouts;
- Alternative designs;
- Alternative processes; and
- Alternative mitigation measures.

The different types of alternatives stated in the EPA Draft Guidelines are used within this chapter and discussed below.

The reasonable alternatives considered by the developer depend on the nature and extent of the project and the objective which the project seeks to achieve, as a result not all of the different types of alternative are considered relevant to the proposed Relevant Action, their relevance and further consideration is detailed in *Section 4.4: Scope of Alternatives to be Considered.*

4.4 Scope of Alternatives to be Considered

4.4.1 Do Nothing Scenario

The do-nothing scenario is the North Runway Permission i.e the permitted / constrained scenario. The North Runway Permission contains 31 planning conditions. Two of these planning conditions (Conditions 3(d) and 5) relate to operating restrictions on the use of the runways and overall number of permitted flights at night, and these are due to come into force once the North Runway is operational in 2022.

Since the North Runway Permission was granted, there was rapid growth in passenger numbers, and the current runway infrastructure was already at capacity at peak times in 2018 and 2019.

Notwithstanding the current situation with Covid-19, there is still a need to safeguard the return to growth in air traffic movements at the airport which means addressing the night-time operating restrictions attached to the North Runway permission.

In summary, in the constrained scenario (i.e the North Runway Permission), there is a forecasted 3.2% decrease in flights across a 24-hour period in 2025 and a significant reduction in available night time slots at the airport and associated impacts on air connectivity for Ireland.

4.4.2 Reasonable Alternative Locations

As the proposed Relevant Action relates only to a change in operating restrictions, and does not comprise the delivery of any physical infrastructure or construction works, it has not been relevant to consider reasonable alternative locations.

4.4.3 Reasonable Alternative Layouts

As the proposed Relevant Action relates only to a change in operating restrictions, and does not comprise the delivery of any physical infrastructure or construction works, it has not been relevant to consider reasonable alternative layouts.

4.4.4 Reasonable Alternative Designs

As the proposed Relevant Action relates only to a change in operating restrictions, and does not comprise the delivery of any physical infrastructure or construction works it has not been relevant to consider reasonable alternative designs.

Alternative flight paths have been assessed, and these are included within the 'Alternative Processes' sub-section of this EIAR chapter.

4.4.5 Reasonable Alternative Processes

For alternative processes, the EPA Draft Guidelines, *Section 3.4.6 Alternative processes* state:

"*Within each design solution there can be several different options as to how the processes or activities of the project can be carried out.*"

The following options have been considered by daa under the Regulation 598 Assessment process:

- **Permitted mode of operation:** Alternative modes of operation considered are described further in this EIAR chapter.
- **Alternative flight paths:** Departing aircraft follow specific paths at take-off. Alternative flight paths considered are described further in this EIAR chapter.

Alternatives to restrictions: on operating hours for the night-time period (permitted operations currently prevent the use of the North Runway between 23:00-07:00 hours).

4.4.6 Alternative Mitigation Measures

Section 3.4.7 of the EPA Draft Guidelines also note that: *'it may be possible to mitigate environmental effects in different ways'*. The proposed Relevant Action relates only to a change in operating restrictions at night time, and does not comprise the delivery of any physical infrastructure or construction works. The consideration of Noise mitigation is also a requirement within Part 2 of the Aircraft Noise (Dublin Airport) Regulation Act 2019, which requires that the competent authority adopt a "Balanced Approach" with regards to noise impacts in particular.

Mitigation measures are discussed by each individual specialist topic throughout this EIAR and discussed in detail in the Dublin Airport North Runway, Regulation 598/2014 (Aircraft Noise Regulation) Forecast Without New Measures and Additional Measures Assessment Report (Hereafter referred to as the Aircraft Noise Regulation 598 Assessment) which will accompany this application for a proposed Relevant Action. The most effective mitigation has been proposed. These measures and the preferred option are outlined in detail the EIAR Chapter 13: Aircraft Noise and Vibration.

4.5 Limitations

As noted above, the proposed Relevant Action relates only to change in operating restrictions. There is no requirement for additional or relocated physical infrastructure or for construction works beyond that already consented by the North Runway Permission. The North Runway is currently being constructed.

In addition to the above, aviation policy, specific aircraft noise regulation (such as the Aircraft Noise (Dublin Airport) Regulation Act 2019), aviation industry requirements and national economics can affect the consideration and viability of alternatives.

4.6 Reasonable Alternatives Considered

4.6.1 Do Nothing Scenario

The first step in considering alternatives is the analysis of the Permitted (Do Nothing) versus Proposed (Do Something) scenarios.

As described in more detail in EIAR Chapter 3: Background and Need for the Project, it is considered that a Do Nothing Scenario would inhibit economic growth, the following distinct categories are highlighted as areas which may be affected by the Do Nothing scenario:

- Direct Economic Impact. The employment, income and economic output associated with the operation and management of activities at the airports including firms located on-site at Dublin Airport and Airport-related businesses located elsewhere.
- Indirect Economic Impact. The employment, income and economic output generated by industries that supply and support the activities at Dublin Airport, such as food wholesalers, fuel refiners, etc.
- Induced Economic Impact. The economic activity generated by the employees of firms directly or indirectly connected to Dublin Airport spending their income in the national economy.
- Catalytic Impacts. These capture the way in which Dublin Airport facilitates the business of other sectors of the economy. Air transportation supports employment and economic development in the national economy by facilitating trade, tourism, investment, and productivity growth.

daa appointed InterVISTAS to conduct a study (October 2020) on the overall economic impact of the restrictions on permitted operations (i.e the North Runway Permission), building on work completed by Mott McDonald to assess and quantify the overall traffic impacts of the operating restrictions at Dublin Airport. The analysis suggests that as a result of the permitted / constrained scenario, the Irish economy could forgo an additional 3,430 jobs and €262 million in GVA by 2025. It should also be noted that the compounding impact of the COVID19 pandemic in combination with the permitted / constrained scenario could increase this economic pressure on the Irish Economy further, for this reason the Do Nothing scenario will not meet the objective of the proposed Relevant Action and is not considered as a feasible alternative scenario.

4.6.2 Alternative Processes and Mitigation

This section briefly describes the various assessment scenarios that have been considered, and any scenario-specific modelling assumptions that have been used.

The modelling of alternatives has focused on the noise from airborne aircraft and aircraft on the runways, which is the main source of noise related to the airport. This is the source of noise that has routinely been modelled in response to the noise mapping requirements of EU Directive 2002/49/EC and informs the Noise Action Plan for the airport. Ground noise has also been assessed for the do nothing scenario and the resulting preferential runway use scenario, and the results of this assessment confirms the relative importance of the noise from airborne aircraft and aircraft on the runways when considering the noise impacts of the airport. These sources are therefore considered sufficient to provide the main reasons for selecting the option chosen.

The methods adopted for the assessment of noise from airborne aircraft and aircraft on the runways are in accordance with the European Civil Aviation Conference Report Doc 29 entitled "Standard Method of Computing Noise Contours around Civil Airports", 4th Edition.

The Aircraft Noise Regulation 598 Assessment appraised the different noise measures and scenarios available to the airport to determine the feasibility of alternative operations of the runway system at night at Dublin Airport. Mitigation measures that already exist, are currently planned, or are determined not to be practical and/or safe are

not considered further as feasible additional scenarios. As a result, the qualitative screening analysis identified three potential additional measures that are recommended for continued evaluation: preferential runway use, respite / alternate runway use and a residential dwelling unit sound insulation grant scheme.

The types found to be feasible were retained for further assessment within the defined specific scenarios that follow in this chapter.

The Aircraft Noise Regulation 598 Assessment identified eight feasible preferential runway use measures. As the proposed Relevant Action does not propose to alter the operation of the runway system during the daytime, all the measures share a common runway use configuration between 07:00 and 22:59:

- When winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control.
- When winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft.
- The parallel runways (10R-28L and 10L-28R) shall be used in preference to the cross runway, 16-34.

This use pattern is referred to as Option 7b.

Forecast schedules have been produced by daa for both "proposed / unconstrained" and "permitted / constrained" operations for the two future years (2022 and 2025) and form part of this planning application package. These have been processed by the noise consultant (Bickerdike Allen Partners (BAP) and assumptions made where relevant in relation to aircraft type, route usage, dispersion, flight profiles, and performance of future aircraft types. These assumptions are the same for all scenarios assessed. The only difference between the scenarios is the mode of operation on the runway system at night.

In addition to the future scenarios the assessment has been extended to include a comparison with current (2018) activity.

Regarding the split by runway there are a few general terms that it is useful to define at this juncture:

- **Segregated Mode**: Most of the time the airport will operate in segregated mode, i.e. one runway for all arrivals, and the other for all departures.
- **Semi-mixed and Mixed Mode**: In peak hours operating in segregated mode does not provide enough capacity, and therefore semi-mixed or mixed mode may be required. In mixed mode both runways can be used for arrivals and departures. In semi-mixed mode 2 runways are used for departures and one for arrivals.
- **Option 7b**: This is the preferential use of runways. It relates to segregated mode and generally provides that westerly arrivals will use the south runway and easterly arrivals will use the north runway, with departures using the opposite runway.

During semi-mixed mode operations, the choice of runway for departures is based on their departure route. Arrivals will still operate as per Option 7b as much as possible.

The runways use permitted is in accordance with Option 7b when North Runway is operational. As a result, the current operating conditions will result in both runways operating in a segregated mode i.e. one runway will be used for arrivals and the other runway will be used for departures but in semi-mixed mode where required (as per Option 7b).

This mode of operation was assessed in the 2004 EIS as part of the initial North Runway application and subsequently was conditioned by Condition 3 of the North Runway Permission.

A number of alternative modes of operation have been assessed under the Regulation 598 Assessment, in order to determine the optimum scenario.

Because the measures are designed to address night-time noise effects, the difference among the eight measures is the preferred runway use configuration at night. Three preferential runway use scenarios (Scenarios 2, 9 and 10) provide access to both runways between 23:00 and 23:59, and between 06:00 and 06:59 and prefer use of one runway between 00:00 and 05:59. Scenario 10 suggests switching between North Runway and South Runway to provide respite between 00:00 and 05:59. Two preferred runway use scenarios operate in semi-mixed mode (mixed mode for arrivals or departures only) between 23:00 and 06:59 (Scenarios 7 and 8). One scenario maintains Option 7b for 24-hours (Scenario 3), and another proposes Reverse Option 7b during night-time hours (Scenario 4). Scenario 5 suggests alternating between Option 7b and Reverse Option 7b during night-time hours to provide respite.

Table 4-1 below summarises each preferential runway use measure assessed in the Aircraft Noise Regulation 598 Assessment

Table 4-1 Feasible preferential runway use measures

Scenario	Title	Description
Scenario 2	Option 7b and South Runway Only between 00:00 and 05:59	06:00 to 23:59: When winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control. When winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft. 00:00 to 05:59: Movements preferred on the South Runway only (single runway).
Scenario 3	Option 7b for 24-Hours	24 hours: When winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control. When winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft.
Scenario 4	Option 7b and Reverse Option 7b between 23:00 and 06:59	07:00 to 22:59: When winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control. When winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft. 23:00 to 06:59: When winds are westerly, Runway 28R shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control. When winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10L shall be preferred for departing aircraft.
Scenario 5	Option 7b and Alternate Option 7b and Reverse Option 7b between 23:00 and 06:59	07:00 to 22:59: When winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control. When winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft. 23:00 to 06:59: Preferred arrival runway will alternate between North and South Runways while either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control in westerly and preferred departure runway will alternate between North and South Runways while either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft in easterly wind conditions each day.
Scenario 7	Option 7b and Semi-Mixed Mode – Mixed Mode for Departures and Option 7b for Arrivals between 23:00 and 06:59	07:00 to 22:59: When winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control. When winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft. 23:00 to 06:59: Both North and South Runways available for departures (runway used depends on whether turn to the north or south is required based on destination); prefer arrivals landing on the South Runway in westerly conditions and the North Runway in easterly conditions unless this exceeds the single-runway capacity for a given hour. If single-runway capacity is exceeded, then arrivals are moved to the other runway.
Scenario 8	Option 7b and Semi-Mixed Mode – Mixed Mode for Arrivals and Option 7b for Departures between 23:00 and 06:59	07:00 to 22:59: When winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control. When winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft 23:00 to 06:59: Both North and South Runways available for arrivals (assumed 50/50 split); prefer departures take off on the North Runway in westerly conditions and the South Runway in easterly conditions.
Scenario 9	Option 7b and North Runway Only between 00:00 and 05:59	06:00 to 23:59: When winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control. When winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft. 00:00 to 05:59: Movements preferred on the North Runway only (single runway).
Scenario 10	Option 7b and Alternate Use of North and South Runway between 00:00 and 05:59	06:00 to 23:59: When winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control. When winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft. 00:00 to 05:59: Alternate each night between movements on the North Runway only and the South Runway only.

Scenario Title Description

The assessment that was carried out found that all but Scenario 7 were effective in reducing the highly annoyed (HA) and highly sleep disturbed (HSD) populations below the Forecast without New Measures scenario and the 2018 situation. The 'Forecast without new measures scenario' is described in the Aircraft Noise Regulation 598 Assessment as:

"Revoking North Runway Permission, Condition 5 and replacing North Runway Permission, Condition 3(d) with a fully mixed mode runway use configuration, while retaining multiple existing and planned noise management measures, would prevent the forgone economic impact and meet the cNAO[1]."

The preferential runway use scenario with the lowest number of people exposed to changes that potentially causes significant adverse effects caused by the change in noise levels for both L_{night} and L_{den} levels is Scenario 2.

In the order of completeness, high level environmental appraisals that assessed the scenarios presented in the Aircraft Noise Regulation 598 Assessment were undertaken, and concluded that the anticipated order of magnitude is the same or similar in all scenarios except for aircraft noise which is seen as the key differentiator (i.e. most important factor).

The EPA Draft Guidelines state that "*it is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA' of each alternative is not required.*"

It is important to note that none of the scenarios would require any amendment of conditions of the North Runway Planning Permission governing the daytime operation of the runway system (i.e., conditions which are not specific to night-time use, namely conditions no. 3 (a), 3(b), 3(c) and 4 of the North Runway Planning Permission) or any amendment of permitted annual passenger capacity of the Terminals at Dublin Airport. Condition no. 3 of the Terminal 2 Planning Permission (Fingal County Council Reg. Ref. No. F04A/1755; ABP Ref. No. PL06F.220670) and condition no. 2 of the Terminal 1 Extension Planning Permission (Fingal County Council Reg. Ref. No. F06A/1843; ABP Ref. No. PL06F.223469) provide that the combined capacity of Terminal 1 and Terminal 2 together shall not exceed 32 million passengers per annum.

All of the scenarios appraised relate to the operation of the airport at night time only, and do not require the development of any physical or other infrastructure. Simply put, all of the scenarios comprise the same number of Air Traffic Movements (ATMs), the same use of the flight paths and do not require the amendment of the permitted annual passenger capacity of the terminals at Dublin Airport. Therefore, the anticipated environment effects across all environmental factors are assessed as being in the same order of magnitude in all scenarios. This is different for the environment factor of Noise, which is therefore seen as the key differentiator as this is the only environmental factor that will experience different effects in the different scenarios due to the uses of the runway system under each scenario.

Table 4-2 below shows the summary of the high-level environmental appraisal undertaken of the scenarios above and details whether the environmental topic areas are likely to result in differences in the magnitude of effect.

[1] cNAO: To limit and reduce the adverse effects of long-term exposure to aircraft noise, including health and quality of life, so that long-term noise exposure, particularly at night, does not exceed the situation in 2018. This should be achieved through the application of the Balanced Approach.

Table 4-2 Environmental Topic Area Summary Appraisal

	Anticipated Order of Magnitude of Effect Between Scenarios											
Scenario	Population and Human Health	Major Accidents and Disasters	Transport and Transportation	Air Quality	Climate and Carbon	Water	Air and Ground Noise and Vibration	Biodiversity (Terrestrial & Aquatic)	Landscape and Visual	Land and Soils	Material Assets	Cultural Heritage
Scenario 1	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Potential for significant effects	Negligible	No Change	No Change	No Change	No Change
Scenario 3	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Potential for significant effects	Negligible	No Change	No Change	No Change	No Change
Scenario 4	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Potential for significant effects	Negligible	No Change	No Change	No Change	No Change
Scenario 5	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Potential for significant effects	Negligible	No Change	No Change	No Change	No Change
Scenario 6	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Potential for significant effects	Negligible	No Change	No Change	No Change	No Change
Scenario 7	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Potential for significant effects	Negligible	No Change	No Change	No Change	No Change
Scenario 8	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Potential for significant effects	Negligible	No Change	No Change	No Change	No Change
Scenario 9	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Potential for significant effects	Negligible	No Change	No Change	No Change	No Change
Scenario 10	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Potential for significant effects	Negligible	No Change	No Change	No Change	No Change

The modelling of alternatives has focused on the noise from airborne aircraft and aircraft on the runways, which is the main source of noise related to the airport. This is the source of noise that has routinely been modelled in response to the noise mapping requirements of EU Directive 2002/49/EC and informs the Noise Action Plan for the airport. Ground noise has also been assessed for the do nothing (permitted / constrained) scenario and the resulting preferential runway use scenario, and the results of this assessment confirms the relative importance of the noise from airborne aircraft and aircraft on the runways when considering the noise impacts of the airport. These sources are therefore considered sufficient to provide the main reasons for selecting the option chosen.

The methods adopted for the assessment of noise from airborne aircraft and aircraft on the runways are in accordance with the European Civil Aviation Conference Report Doc 29 entitled "*Standard Method of Computing Noise Contours around Civil Airports*", 4th Edition.

Table 4-2 presents a summary of the results from the desktop appraisal undertaken by the technical environmental specialists to determine the order of magnitude of effect between the scenarios provided in Table 4-1. As seen in Table 4-2 above, the anticipated order of magnitude is considered to be the same or similar in all scenarios across the different environmental topic areas except for Noise which is seen as the key differentiator (most important factor) and so is considered in detail within the Aircraft Noise Regulation 598 Assessment and within Chapters 13: Air Noise and Vibration and Chapter 14: Ground Noise and Vibration as it is the only aspect of the project with the likelihood of potential significant effects.

4.7 Conclusions

It is has been determined that consideration of reasonable alternative locations, alternative layouts and alternative designs of the proposed Relevant Action are not relevant as the application only relates to a change in operating restrictions, and does not comprise the delivery of any physical infrastructure or construction works.

The Do Nothing scenario is also not considered as a feasible option due to the extent to which leaving the permitted / constrained scenario in place will inhibit economic growth. The assessed impact is a loss of air traffic movements and associated loss in 1.1m passengers per year (-3.5%) and a cumulative loss over the 4-year period 2022-2025 of 4.3m passengers.

Scenario 2 was assessed as the preferential runway use scenario with the lowest number of people exposed to changes that potentially cause significant adverse effects caused by the change in noise levels for both L_{night} and L_{den} levels. For all environmental topics in the EIAR the difference between each of the alternative scenarios is negligible.

Chapter 05:
Consultation

05

5. Consultation

5.1 Introduction

As set out in Chapter 1 of this EIAR, planning permission was granted for North Runway in 2007. In 2016 daa commenced a process of consultation relating to proposals to address the restrictive night-time conditions 3d and 5. This was in anticipation of a planning process that would seek to amend the conditions. The overall approach to consultation and information sharing is related to the North Runway project and operation of the Dublin Airport runway system at night in its entirety. Due to the nature of the project, construction activity was ongoing at the same time that daa was consulting on changes to night-time operational conditions (Condition 3d and 5). Therefore, the overall consultation and stakeholder engagement process included elements relating to the construction of North Runway and proposals to change the operational conditions (3d and 5).

daa had always indicated its intent to seek a review of Condition 3d and 5 when the legislation enabling such a review was enacted. The early consultation on the project was in anticipation of such legislation. However, there was a significant delay in the introduction of the legislation giving effect to Regulation 598/2014 in national law, designating the Airport Noise Competent Authority, and amending planning legislation. This legislation, the Aircraft Noise (Dublin Airport) Regulation Act 2019, allows for the airport to apply for a Relevant Action to amend, revoke or replace operating restrictions.

The 2016 consultations made clear that daa would seek a review of Condition 3d and 5. The main focus of the consultations at that time was proposals on runway use and flight paths, and related effects (including noise) and mitigation measures. The feedback from these consultations where relevant has been taken on board when developing this Relevant Action application.

Consultation on proposals that daa would seek on changes to Condition 3d and 5 of the North Runway planning permission was undertaken in June and December 2016. The similarities between these proposals in 2016 and the proposed Relevant Action relate to the proposed use of the runway system at night time and that there are no proposals to change the day time operation. The similarities also relate to the proposals on the degree of divergence for departing aircraft from the North Runway as well as proposals on the eligibility threshold for any future night time insulation offers that might be incorporated into the final planning application, in this case, the proposed Relevant Action.

During that time daa also established a community engagement team which works closely with the wider Dublin Airport business to provide information of interest to local residents and other parties. In addition, a Community Liaison Group was established in accordance with Condition 28 of the An Bord Pleanála Decision to Grant Permission (PL06F.217429) with representation from Fingal County Council, daa and the St. Margaret's Community. Briefings and update on the North Runway project were provided to these groups.

5.2 Consultation Approach

Consultation on proposals that daa would plan to make to seek changes to Condition 3d and 5 of the North Runway planning permission was undertaken in June and December 2016.

The consultation approach at the time included a combined strategy involving direct face-to-face events with members of the public and other relevant stakeholders, a feedback facility to provide comments on the proposal as well as a broader social media base to promote engagement, provide information and keep communities informed.

The overall consultation was underpinned by two specific phases of public consultation:

- Consultation Phase 1 Introduction to the project and EIAR Scoping (2016)
- Consultation Phase 2 Consultation on flight paths and change to permitted operations

In preparing this Relevant Action application, daa has taken on board elements of the Phase 2 2016 consultation and in particular the outcomes from consultation which focussed on the proposed flight paths and noise mitigation proposals associated with proposals to change Condition 3d and 5.

5.3 Context of Public and Stakeholder Engagement

In compliance with the Aarhaus Convention, public participation has been a part of the North Runway Project which includes the construction phase and the planning process relating to proposals to change the runway operating conditions. A guide to the requirements of the Convention was published by UNECE in 2014 entitled The Aarhus Convention: An Implementation Guide.

The Aarhus Convention sets down basic rules to promote the involvement of the public in environmental matters and to improve the enforcement of environmental law. The European Union has been a party to the Aarhus Convention since May 2005 and the Aarhus Convention is now an integral part of the EU legal order. Ireland ratified the Aarhus Convention in June 2012.

The provisions of the Aarhus Convention are divided into three pillars as follows:

- **Access to Environmental Information**: the right of members of the public to request environmental information that is held by public bodies and these bodies are obliged to maintain this information. The Access to Information pillar has been implemented in EU Directive 2003/4/EC on Public Access to Environmental Information and in Ireland by the European Communities (Access to Information on the Environment) Regulations 2007-2014.
- **Public Participation in Environmental Decision-Making**: the right of the public to participate in decision-making in environmental matters and for public authorities to enable the public to comment on proposals which affect the environment. Article 6 of the Aarhus Convention sets out detailed rules governing public participation in decision making involving the activities listed in Annex I to the Convention and activities that are not listed in the Annex but may have a significant effect on the environment. In the European Union, this part of the Aarhus Convention has been implemented by Directive 2003/35/EC on public participation (Directive, inter alia, the Consolidated EIA Directive 2011/92/EU). The requirements of the Public Participation Directive have been transposed into Irish law, including the integration of its requirements into the Planning and Development Act 2000, as amended.
- **Access to Justice**: the right of members of the public to review procedures to challenge decisions relating to the environment, made by public bodies or private persons that have been made without regard to the two aforementioned pillars of the Convention.

The consultation approach for the North Runway project was drawn up in the context of the three pillar concepts and aimed to ensure that the public participation activities devised for the project were accessible, meaningful and accountable. To achieve this the Applicant adopted a wide variety of communications methods and tools and further details on these are outlined in Section 5.4 below.

5.4 Consultation Tools

A range of communications tools were employed for the North Runway project consultation process in order to raise levels of awareness of the project and to facilitate participation in the consultation process. Key components of that consultation are:

- Public consultation events.
- Meetings with a range of resident groups and individuals.
- Regular meetings with Dublin Airport Environmental Working Group (DAEWG), St. Margaret's Community Liaison Group, residents associations, airport staff, airlines and businesses;
- Bimonthly drop-in clinics at various community locations at which local residents and interested parties can seek information regarding North Runway and other airport operations;
- Home visits to those local residents who are unable to attend consultations or drop-in clinics;
- A series of dedicated meetings and home visits with participants in the project's noise mitigation schemes;
- In collaboration with a local social services agency, undertook a roadshow in various North Dublin locations to promote the project's Local Employment Initiative (which won the Fingal Chamber Best Community Involvement award in 2019);
- Fully-manned dedicated project freephone and email channels;
- A dedicated project webpage hosted on the Dublin Airport website, https://www.dublinairport.com/corporate/north-runway

- Up-to-date project information via a subscriber-based Project Update;
- Press releases and media coverage;
- Social media;
- Communication materials including leaflets, posters, brochures and display materials for consultation events.
- Mail-outs and briefings to Elected Representatives of Fingal County Council, Dublin City Council, Dail Eireann and Seanad Eireann;
- Mail-outs to key environmental stakeholders;
- Dedicated Red C Survey on flightpaths options and community funding as part of the consultation on Change to Permitted Operations and Flightpaths https://www.dublinairport.com/docs/default-source/resources/view-red-c-research-report.pdf?sfvrsn=2ab85915_2

A bespoke Virtual Reality Platform which provides virtual materials and information as would appear at a public event has been devised as a means of informing the public about this Relevant Action application once lodged. This was developed in order to continue meaningful engagement with local residents despite the current Covid crisis.

5.5 Consultation Summary

The proposed Relevant Action application relates to proposals to amend and replace Condition 3d and 5 of the North Runway planning permission. The focus of the Phase 2 Consultation in 2016 was similar except at that time daa was proposing to remove both conditions and the proposals would have resulted in a greater number of aircraft flight movements on the runway system than now being proposed in the Relevant Action application. The key elements from the 2016 consultation that are carried forward into the Relevant Action application are the details of the proposed flights paths and some of the noise mitigation proposals.

5.6 Stakeholder Engagement

The Applicant has, and continues to engage with a variety of stakeholders, and will continue to manage effective relationships with a wide array of stakeholders. Successful delivery of the Relevant Action requires constructive consultation with several statutory and non-statutory bodies which include:

- The competent authority: Fingal County Council (FCC) and all its relevant departments, officers and representatives among which:
  - Planning Dept
  - Transportation Dept
  - Water Service Dept
  - Conservation Dept
  - Architecture Dept
  - Parks Dept
  - Environmental Services Dept
  - FCC Chief Executive
  - FCC Heritage Officer
  - FCC Director of Planning and Strategic Infrastructure
- Airport Stakeholders:
  - Irish Aviation Authority (IAA)
  - Commission for Aviation Regulation (CAR)
  - Airline Operators
- Public:
  - The Local Community
  - Elected Representatives

5.7 Incorporation into EIAR

The information contained in this chapter, and the feedback from previous consultation exercises, has been considered by the wider project team and has been integrated, where relevant to the current proposed Relevant Action application.

Chapter 06: Planning and Development Context

06

6. Planning and Development Context

6.1 Introduction

This EIAR chapter sets out the legislative and planning policy context for the proposed Relevant Action. It includes reference to relevant national and local planning policies, including those that have been considered when determining the EIAR scope, method and mitigation.

6.2 Strategic Planning Context

daa has a number of obligations to fulfil with regard to the management of Dublin Airport. Pursuant to Section 23(1) of the Air Navigation and Transport (Amendment) Act 1998, the principal objectives of the daa include:

- to own, either in whole or in part, or manage, alone or jointly with another person, airports whether within the State or not,
- to take all proper measures for the safety, security, management, control, regulation, operation, marketing and development of its airports,
- to provide such facilities, services, accommodation and lands at airports owned or managed by the company for aircraft, passengers, cargo and mail as it considers necessary,
- to promote investment at its airports,
- to engage in any business activity, either alone or in conjunction with other persons and either within or outside the State, that it considers to be advantageous to the development of the company, and
- to utilise, manage and develop the human and material resources available to it in a manner consistent with the objects aforesaid.

In 2009, pursuant to Section 10 of the Aviation Regulation Act 2001, the Minister for Transport issued a statutory direction to the Commission for Aviation Regulation (CAR) stating *"The desirability that Dublin Airport should have the terminal and runway facilities to promote direct international air links to key world markets, such as new and fast-developing markets in the Far East and the importance of ongoing and planned infrastructure development in this context." In* this regard it is considered that North Runway forms part of the 'runway facilities' identified as being required to promote direct international air links.

In addition, the National Aviation Policy (2015) includes Action 4.5.1 which states the following:

"*The process to develop the second runway at Dublin Airport will commence, to ensure the infrastructure necessary for the airport's position as a secondary hub and operate to global markets without weight restrictions is available when needed.*"

It is considered that the strategic planning context is clear in providing overarching support for ongoing investment in Dublin Airport and that North Runway provides the necessary infrastructure to ensure that the airport can become a secondary hub.

6.2.1 Aircraft Noise (Dublin Airport) Regulation Act 2019 – Application of EU Regulation 598 – The Balanced Approach

The Aircraft Noise (Dublin Airport) Regulation Act 2019 (The Aircraft Noise Act), implements EU Regulation 598/2014 on the establishment of rules and procedures with regard to the introduction of noise related operating restrictions at European Union Airports within the Balanced Approach.

The Aircraft Noise Act amends the Planning and Development Act 2000, as amended, to cater for the situation where development at Dublin Airport may give rise to an aircraft noise problem and where an airport wishes to apply to revoke, amend or replace operating restrictions at the airport.

The Aircraft Noise Act was enacted on 22nd May 2019. It was subsequently amended on 1st September 2019, following the removal of Airport infrastructure from the Seventh Schedule of the PDA and thus the strategic infrastructure development planning process is no longer applicable to it.

Fingal County Council has been designated as the competent authority for the purposes of aircraft noise regulation at Dublin Airport by section 3(1) of the Aircraft Noise (Dublin Airport) Regulation Act 2019.is

The Aircraft Noise Act amends the PDA by inserting a number of new sections in Part 3 of the PDA, which deals with control of development. These sections introduce a number of new measures for planning applications at Dublin Airport that may necessitate noise-related actions or that may require a new operating restriction.

Section 34C of the PDA permits an applicant who is currently subject to a planning permission for development at the airport that includes an operating restriction, to make an application under Section 34C of the PDA to revoke, amend, replace or take other action in respect of the operating restriction. Pursuant to Section 34C (23) of the PDA this is defined as a proposed 'Relevant Action'. In this regard, daa is enabled to make this application for a proposed relevant action as it seeks to make changes to the operating restrictions imposed by the North Runway Permission.

A separate Regulation 598/2014 Assessment has been prepared by Ricondo and is submitted with the Relevant Action application and this EIAR.

6.3 National and Regional Planning Policy

6.3.1 National Policy

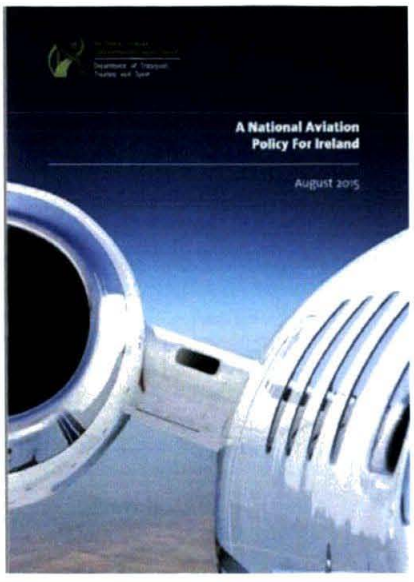
Dublin Airport is a growing airport that serves as a major transport hub for millions of business and leisure travellers, a gateway for tourism and foreign direct Investment (FDI) and a critical facilitator of connectivity for an island nation. Passenger traffic through Dublin Airport has grown exponentially since the economic recovery. Notwithstanding this, as a result of the Covid-19 Pandemic, as per all other international airports, Dublin Airport has seen a significant drop in air traffic movements and passenger numbers. However, strong sustained growth is expected to return post pandemic. Preparation of this EIAR has been ongoing for many months and includes detailed environmental modelling and assessment based on air traffic forecasts prepared in 2019. In March 2020, it became apparent that the Covid-19 pandemic was having a significant impact on global aviation. The immediate impacts were severe, and in the short-medium term these impacts will continue to manifest themselves in reduced air traffic demand in Ireland and globally. For the purposes of this EIAR the long-term impact (2025 and beyond) of the operating restrictions[2] is assessed, and it is expected that air traffic will recover over this longer period, so it is reasonable to show the environmental and economic effects over the longer term. For these reasons the conclusions of these pre-Covid 19 air traffic forecasts prepared in 2019 are reasonable and thus included.

Notwithstanding the above referenced impact of Covid-19 on current demand for travel, as highlighted below, it is imperative that Dublin Airport is provided with the necessary infrastructure and facilities to support future growth at the airport in line with National Policy direction.

6.3.2 National Aviation Policy 2015 (NAP)

The Department of Transport, Tourism and Sports published the National Aviation Policy for Ireland in August 2015 (NAP). The NAP acknowledges the importance of the aviation sector to the Irish economy and advocates the development of a secondary hub at Dublin Airport. Section 4.3 of the NAP describes this as follows:

[2] Operating restrictions refer to the restrictions imposed under conditions 3(d) and 5 of the North Runway permission.



"The size and location of Dublin Airport distinguishes it from the other State airports. Dublin Airport has seen a major increase in the numbers of transfer passengers in recent years with significant benefits to the broader economy. An opportunity now exists to develop Dublin as a vibrant secondary hub, competing effectively with the UK and other European airports for the expanding global aviation services market. A hub combines local passengers with transfer passengers enabling airlines to operate services to more destinations and more frequently than could be supported by local demand alone. This allows airport operators to utilise airport assets more efficiently, to exploit economies of scale and to drive down per passenger airport charges to the benefit of airport users and passengers. In this context, the support and promotion of Dublin as a hub airport is an important means of maximising air access for the Irish economy. Dublin Airport is currently (summer 2015) ranked fifth in Europe in terms of weekly transatlantic seats, and is therefore well placed for further development as a hub for global business."

In relation to the future capacity needs of the State Airports, the plan states under Section 4.5:

'It is recognised that European airports are currently facing capacity constraints and that this situation will worsen in the context of expanding aviation services markets. While existing capacity at Irish State airports is adequate for current demands, it is essential that Ireland is equipped to exploit emerging opportunities to expand air service connections for business, tourism, cultural and educational purposes, and thus to deliver economic benefits at the national level. These opportunities exist not just for new emerging markets in the Asia Pacific region, but also with our traditional trading partners in Europe and North America. Air transport requires a specific level of airport infrastructure, both in terms of quantity and quality, to facilitate the optimum level of air services for Ireland. This includes terminal and runway capacity as well as surface access to airports, and is particularly relevant to the development of Dublin Airport as a secondary hub.

To ensure future connectivity and to deliver growth, it will be important that the State airports, and Dublin Airport in particular, have sufficient capacity and runways of sufficient length to enable services to operate to global emerging markets without weight restriction. It is important that regular reviews are conducted to ensure that all of the main airports are well placed to accommodate passenger growth, changing passenger and air-cargo needs and carrier needs.'

In relation to capacity needs at Dublin Airport, a review was carried out in August 2018 by the Department of Transport, Tourism and Sport entitled 'Review of Future Capacity Needs at Irelands State Airports'. The Review states on page 33:

'The 2015 National Aviation Policy highlights that Dublin will be promoted as a secondary hub airport to support services to global markets. If Dublin Airport can provide facilities to enable airlines to compete effectively with airlines operating at UK and other European hub airports, it may further increase the level of transfer business, which has already grown strongly in recent years. This could enable airlines operating at Dublin to run more frequent flights to existing destinations and offer direct flights to a larger number of destinations than would be possible if services at the airport were entirely reliant on travellers whose ultimate origin or destination was Ireland.'

Section 4.5 of the NAP concerns the future capacity needs of the State Airports and states the following:

"Air transport requires a specific level of airport infrastructure, both in terms of quantity and quality, to facilitate the optimum level of air services for Ireland. This includes terminal and runway capacity as well as surface access to airports, and is particularly relevant to the development of Dublin Airport as a secondary hub."

The NAPs policy position on existing capacity at State airports is discussed in Section 4.5 and highlights that:

'Existing capacity at State airports should be optimised in conjunction with timely planning to enable expansion of air service connections in all relevant markets delivering wider economic benefits for Ireland'.

In addition, the NAP includes Action 4.5.1, which states the following:

"The process to develop the second runway at Dublin Airport will commence, to ensure the infrastructure necessary for the airport's position as a secondary hub and [ability to][3] operate to global markets without weight restrictions is available when needed."

The proposed relevant action is consistent with the NAP in that it supports continued growth at Dublin Airport. In this regard the proposed relevant action to amend and replace the existing operating restrictions will optimise the ability of the airport to utilise its infrastructure, being the runway system, to support Dublin Airport's position as a secondary hub airport and its ability to cater for capacity demands.

6.3.3 Project Ireland 2040: National Planning Framework (NPF)

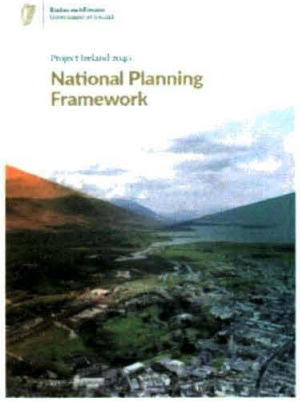
The Department of Housing, Planning and Local Government published Project Ireland 2040: National Planning Framework (NPF) in February 2018. The National Planning Framework (NPF) is:

"the Government's high-level strategic plan for shaping the future growth and development of our country out to the year 2040".

"It is a framework to guide public and private investment, to create and promote opportunities for the people of Ireland, and to protect and enhance the environment- from villages to cities and everything in between." (NPF p10)

It replaces the previous National Spatial Strategy (NSS) as the primary national policy framework. Adopted in 2018, the NPF is designed to improve the effectiveness of public investment in infrastructure and other relevant services around the county, including the enhancement of regional and international connectivity.

Dublin Airport is identified as key infrastructure for national development in the NPF as follows:



"The main airports including Dublin, Cork, Shannon and Ireland West - Knock, together with smaller regional airports, are a key infrastructure for national and regional development." (NPF p145)

The NPF identifies 'High Quality International Connectivity' as a primary National Strategic Outcome of the NPF. Specifically, it states;

"*High-Quality International Connectivity is crucial for overall international competitiveness and addressing opportunities and challenges from Brexit through investment in our ports and airports in line with sectoral priorities already defined through National Ports Policy and National Aviation Policy and signature projects such as the second runway for Dublin Airport and the Port of Cork - Ringaskiddy Redevelopment."* (NPF p14)

The NPF also notes the following under National Strategic Outcome 6: High Quality International Connectivity:

"As an island, the effectiveness of our airport and port connections to our nearest neighbours in the UK, the EU and the wider global context is vital to our survival, our competitiveness and our future prospects." (NPF p145) and further states in relation to the North Runway;

'The development of additional runway and terminal facilities such as the second runway for Dublin Airport for which planning permission has been approved'

Page 37 of the NPF emphasises how Dublin Airport can enable growth within Dublin City and Metropolitan Area, in this regard the NPF discusses how improved access to Dublin Airport will be a key growth enabler for Dublin, stating that:

'Improving access to Dublin Airport, to include improved public transport access, connections from the road network from the west and north and in the longer term, consideration of heavy rail access to facilitate direct services from the national rail network in the context of potential future electrification.'

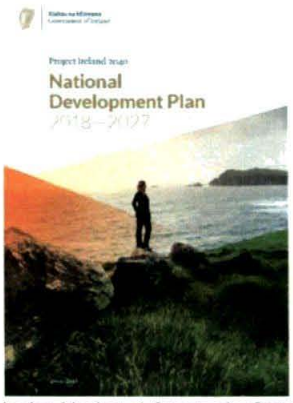
The NPF confirms the important role that Dublin Airport has in supporting the goals of the NPF. In this regard, itis considered that the proposed relevant action will enable the airport to maintain and enhance high-quality international connectivity by ensuring that the airport can appropriately utilise the runway system.

[3] Added by TPA

6.3.3.1 National Development Plan 2018-2027 (NPD)

The National Development Plan 2018 – 2027 (NDP) was published in conjunction with the NPF in February 2018. The NDP is the national plan setting out investment priorities to guide national, regional and local planning and investment decisions.

The NDP supports the implementation of the NPF and also the NAP. Under National Strategic Outcome 6, the NDP identifies the importance of high-quality international connectivity as:



"As an island, continued investment in our port and airport connections to the UK, the EU and the rest of the world, is integral to underpinning international competitiveness. It is also central to responding to the challenges as well as the opportunities arising from Brexit." (NDP p67)

The NDP further states the following under National Strategic Outcome 6:

'Significant investment in Ireland's airports and ports will play a major role in safeguarding and enhancing Ireland's international connectivity which is fundamental to Ireland's international competitiveness, trading performance in both goods and services and enhancing its attractiveness to foreign direct investment. The importance of this objective cannot be understated in the context of the UK's exit from the EU in 2019.'

Under National Strategic Outcome 6, the NDP identifies Dublin Airport as one of its strategic investment priorities, with North Runway as a major national infrastructure project for appraisal and delivery during the lifetime of the Plan (NDP, p67). The plan states;

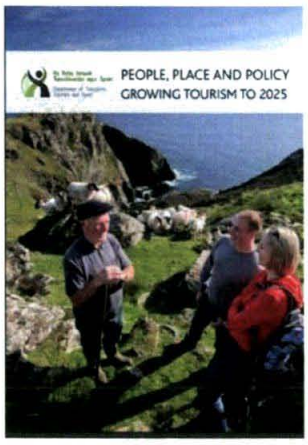
'DAA is planning the delivery of a new runway for Dublin Airport by 2021 at an estimated cost of €320 million which will continue to be developed as an international hub' (NDP, p67)

North Runway is identified as a crucial signature project for achieving Strategic Outcome 6 as part of the National Development Plan 2018-2027. The proposed Relevant Action will fulfil the aims of the NDP by supporting the growth of Dublin Airport, which will enable investment in the airport, thereby supporting Ireland's international competitiveness and attractiveness to foreign direct investment.

6.3.4 National Tourism Policy 2015: 'People, Place and Policy: Growing Tourism to 2025

The Department of Transport, Tourism and Sport published a National Tourism Policy in March 2015 entitled 'People, Place and Policy: Growing Tourism To 2025'.

Section 5.2 of the National Tourism Policy notes the importance of a high quality of service at frontiers:



'In addition to the quality of physical infrastructure at airports and ports, the quality of service to visitors at frontier checks is important in creating a first impression of Ireland's welcome.' (p67)

At page 68, the National Tourism Policy notes *"as an island, inbound tourism and the export earnings and employment supports are profoundly dependent on the volume, affordability and range of air access. Airports are core elements of the tourism infrastructure. In turn, tourism is an important source of traffic and customers for airports."*

In addition to the above, Policy Proposal 5.2.2 in the National Tourism Policy states that:

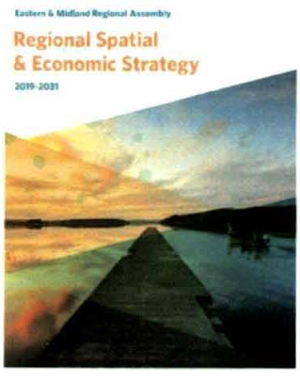
"Air and sea port operators will be encouraged to ensure that visitor reception facilities are managed so that the visitor experience is optimised." (p70)

The proposed relevant action will enable Dublin Airport to continue to meet demand for airline arrivals and departures during night time hours. This is particularly important for the mainly short haul services based at the airport so they can maintain flight slots that provide connectivity with mainland Europe and also provide suitable transfer services to flights arriving from North America. The ability of the airport to maintain these flight slots will ensure that airline travel to/from Dublin is well serviced and remains affordable. As such, it is considered that the

proposed relevant action is fully compliant with the policy provisions and will assist with the implementation of the National Tourism Policy.

6.3.5 Regional Spatial and Economic Strategy for the Eastern and Midland Region (RSES)

The Eastern and Midlands Regional Assembly's Regional Spatial and Economic Strategy, 2019 (RSES) sets out a long-term strategic planning and investment strategy for the Dublin area and surrounding counties and the Midlands to 2031. The RSES acknowledges Dublin Airport as a key national asset to Ireland's economic success which is linked with its global connectivity to trade and tourism markets and requires support to ensure it continues as an economic driver. The RSES acknowledges that the Dublin region is the main global gateway to Ireland with Dublin Airport one of the fastest growing airports in Europe. Page 195 of the RSES states in relation to Dublin Airport;



'Dublin Airport accounted for 85% of all air passengers in the Country in 2016. The number of passengers has increased year on year to reach 29.5 million in 2017 and is forecast to increase again in 2018. Dublin Airport is a key national asset to Ireland's economic success which is linked with its global connectivity to trade and tourism markets and requires support to ensure it continues as an economic driver. The National Aviation Strategy for the first time supports the growth of the Airport to a secondary hub airport; Dublin Airport has a number of features which make it an attractive option for airlines, including the availability of full US Preclearance.'

The main objective of the RSES is to determine at a regional scale how best to achieve the shared goals set out in the National Strategic Outcomes (NSOs) of the NPF. The Dublin Region is identified as the main global gateway to Ireland.

The international gateways of the Eastern and Midland region are noted as playing a critical economic role on both a national and regional level. Section 8.5 of the RSES outlines the regional policies for international connectivity relating to Dublin Airport as follows;

RPO 8.17: Support the National Aviation Policy for Ireland and the growth of movements and passengers at Dublin Airport to include its status as a secondary hub airport. In particular, support the provision of a second runway, improved terminal facilities and other infrastructure.

RPO 8.18: Improved access to Dublin Airport is supported, including Metrolink and improved bus services as part of BusConnects, connections from the road network from the west and north. Improve cycle access to Dublin Airport and surrounding employment locations. Support appropriate levels of car parking and car hire parking.

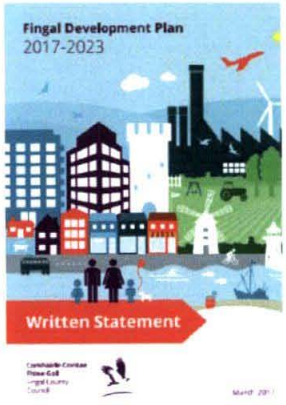
RPO 8.19: Spatial planning policies in the vicinity of the airport shall protect the operation of Dublin Airport in respect to its growth and the safe navigation of aircraft from non-compatible land uses. Policies shall recognise and reflect the airport noise zones associated with Dublin Airport. Within the Inner Airport Noise Zone, provision of new residential and/or other noise sensitive development shall be actively resisted. Within the Outer Noise Zone, provision of new residential and/or other noise sensitive development shall be strictly controlled and require appropriate levels of noise insulation in all cases.

RPO 8.20: Spatial planning policies for areas located within the Public Safety Zones shall reflect the guidance set out in the ERM Report "Public Safety Zones, 2005" (or any update thereof) commissioned by the then Department of Transport and the Department of Environment, Heritage and Local Government, in assessing proposals for development falling within Airport Public Safety Zones.

The proposed relevant action will be entirely consistent with the RSES Policy Objectives, outlined above, which support Dublin Airport as a key national asset to Ireland's economic success. Furthermore, the replacement of the operational restriction included in Condition 5 of the North Runway planning permission, will ensure that the airport can return to its permitted terminal capacity of 32mppa in a timely manner and continue to grow as a secondary hub airport.

6.4 Local Planning Policy

6.4.1 Fingal Development Plan 2017-2023



The site is subject to the 'DA' (Dublin Airport) zoning objective under the Fingal Development Plan 2017-2023 (County Development Plan). This seeks to:

"Ensure the efficient and effective operation and development of the airport in accordance with an approved Local Area Plan." (page 238)

Chapter 6 of the County Development Plan states that:

"The Dublin Airport (DA) zoning is a unique economic development zoning within Fingal, comprising an extensive area of some 1,024 ha. The DA zoning covers all the operational buildings and lands associated with the airport and runways. Within the lifetime of the Development Plan, the Council will prepare a LAP for Dublin Airport that will outline the future vision for the airport, examine its operational requirements and the associated environmental effects."

FCC's strategic policy for Dublin Airport is to:

"Safeguard the current and future operational, safety, and technical requirements of Dublin Airport and provide for its ongoing development within a sustainable development framework of a Local Area Plan. The plan shall take account of any potential impact on local communities and shall have regard to any wider environmental issues." (Page 10)

The Vision for 'DA' zoned lands is to:

"Facilitate air transport infrastructure and airport related activity/uses only (i.e. those uses that need to be located at or near the airport). All development within the Airport Area should be of a high standard reflecting the status of an international airport and its role as a gateway to the country and region. Minor extensions or alterations to existing properties located within the Airport Area which are not essential to the operational efficiency and amenity of the airport may be permitted, where it can be demonstrated that these works will not result in material intensification of land use.

Air Transport Infrastructure includes: aircraft areas, air traffic control/tower, ancillary health, safety and security uses, aprons, cargo handling, maintenance hangers, meteorology, retail – airside/duty free, runways, taxiways, terminals and piers" (Page 368)

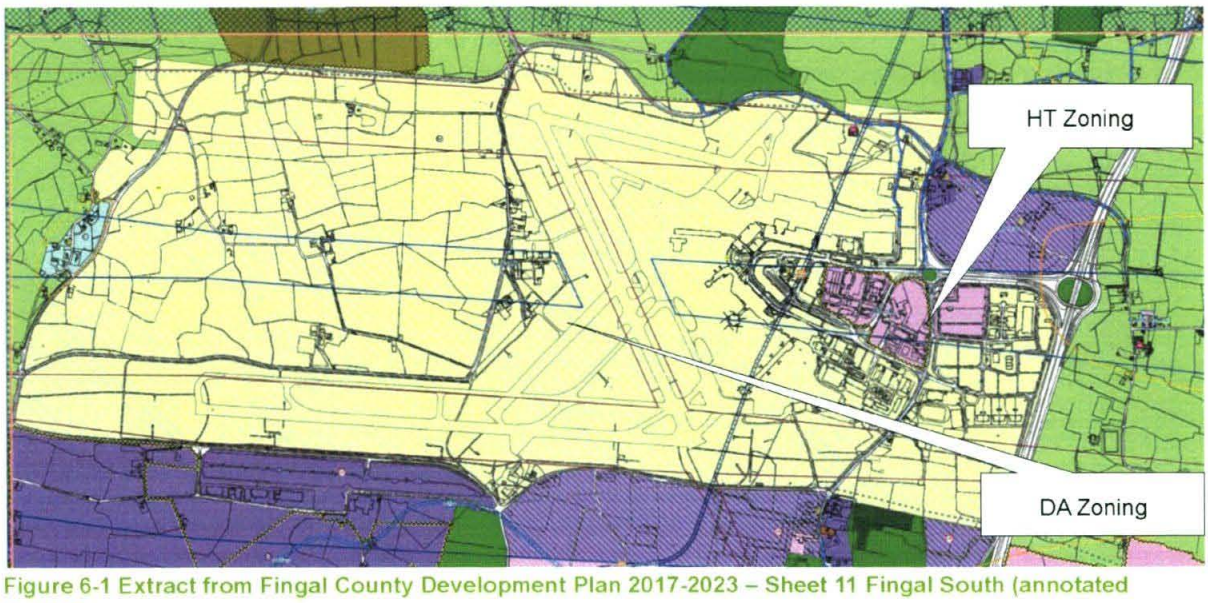


Figure 6-1 Extract from Fingal County Development Plan 2017-2023 – Sheet 11 Fingal South (annotated by TPA)

A portion of the Airport lands are also zoned HT – High Technology under the land use zoning identified in the County Development Plan, as indicated in pink on the Extract from the Fingal Zoning Map, Figure 6-1.

The Zoning Objective for the HT zoned lands seeks to:

'Provide for office, research and development and high technology/high technology manufacturing type employment in a high quality built and landscaped environment.'

Chapter 6 of the County Development Plan states in relation to HT zoning:

'High Technology HT

The purpose of the High Technology (HT) zoning is to facilitate opportunities for major office, science and technology, and research and development-based employment within high quality, highly accessible, campus style settings. The HT zoning is one of the most important economic development zonings in Fingal with just over 685 ha of HT zoned lands located principally in Blanchardstown and Swords, supplemented with significant zonings at Dublin Airport and along the southern boundary of the County with Dublin City'

The County Development Plan further states on page 240 under the heading Dublin Airport Central Masterplan:

"Additionally, the Council, in collaboration with the DAA, will review where appropriate the Dublin Airport Central Masterplan for strategically located lands adjacent to the airport on HT zoned lands. The Masterplan will be a framework for the creation of a high-quality commercial development comprising predominantly office accommodation, supplemented with hotel and ancillary uses, to be delivered on a phased basis.'

The proposed Relevant Action supports the central function of the DA zoning objective. The proposed Relevant Action will also provide for the efficient and effective operation of North Runway and the wider airport runway system.

In addition to the land use zoning, the County Development Plan also contains various Objectives which are of relevance to the proposed relevant action:

Table 6-1 Dublin Airport Objectives, Chapter 7, FCC Development Plan 2017-2023

Objective	Description
DA01	*"Facilitate the operation and future development of Dublin Airport, in line with Government policy, recognising its role in the provision of air transport, both passenger and freight".*
DA03	*"Safeguard the current and future operational, safety, technical and developmental requirements of Dublin Airport and provide for its ongoing development within a sustainable development framework, having regard to both the environmental impact on local communities and the economic impact on businesses within the area".*
DA05	*"Facilitate the development of a second major east-west runway at Dublin Airport and the extension of the existing east-west runway 10/28".*
DA09	*"Ensure that aircraft-related development and operation procedures proposed and existing at the Airport consider all measures necessary to mitigate against the potential negative impact of noise from aircraft operations (such as engine testing, taxiing, taking off and landing), on existing established residential communities, while not placing unreasonable, but allowing reasonable restrictions on airport development to prevent detrimental effects on local communities, taking into account EU Regulation 598/2014 (or any future superseding EU regulation applicable) having regard to the 'Balanced Approach' and the involvement of communities in ensuring a collaborative approach to mitigating against noise pollution."*
DA15	*"Take into account relevant publications issued by the Irish Aviation Authority in respect of the operations of and development in and around Dublin Airport."*
DA16	*"Continue to take account of the advice of the Irish Aviation Authority with regard to the effects of any development proposals on the safety of aircraft or the safe and efficient navigation thereof"*
DA18	*"Ensure that every development proposal in the environs of the Airport takes account of the current and predicted changes in air quality, greenhouse emissions and local environmental conditions."*
DA19	*"Ensure that every development proposal in the environs of the Airport takes into account the impact on water quality, water based-habitats and flooding of local streams and rivers and to provide mitigation of any negative impacts through avoidance or design and ensure compliance with the Eastern River Basin District Management Plan."*

In addition to the above policies, the County Development Plan also makes specific reference to the NAP as well as setting out the following objectives which directly support the proposed relevant action:

Objective ED31

*"**Ensure that the required infrastructure and facilities are provided at Dublin Airport** so that the aviation sector can develop further and operate to its maximum sustainable potential, whilst taking into account the impact on local residential areas, and any negative impact such proposed developments may have on the sustainability of similar existing developments in the surrounding area, and the impact on the environment, including the climate."* (Page 205)

Objective ED32

Ensure an appropriate balance is achieved between developing the unique potential of Dublin Airport as an economic generator and major employer in the County and protecting its core operational function as the Country's main international airport.'

The County Development Plan also sets out the following objectives of relevance to the proposed relevant action:

"Objective AQ01

Implement the provisions of EU and National legislation on air, light and noise and other relevant legislative requirements, as appropriate and in conjunction with all relevant stakeholders."

"Objective NP01

Implement the relevant spatial planning recommendations and actions of the Dublin Agglomeration Environmental Noise Action Plan 2013-2018 (or any subsequent plan), working in conjunction with relevant statutory agencies."

"Objective NP02

Continue to promote appropriate land use patterns in the vicinity of Dublin Airport to minimise the number of residents exposed to undesirable noise levels."

"Objective NP03

Require all developments to be designed and operated in a manner that will minimise and contain noise levels."

"Objective DMS162

Ensure all development proposals include measures to protect and enhance biodiversity."

By supporting the efficient and secure operation of the Airport, the proposed relevant action will be consistent with the objectives set out above. In summary, the proposed relevant action is consistent with the County Development Plan in that it supports growth at Dublin Airport and will contribute to connectivity and the local economy by providing additional passenger capacity and safeguarding operations at the airport.

It is noted that the application site is located within the Inner Public Safety Zone (PSZ) for Dublin Airport. The purpose of the PSZ is to restrict inappropriate land use within the environs of the runways at Dublin Airport.

The Public Safety Zone Report prepared by Environmental Resource Management Ireland Ltd. (ERM) 2003 on behalf of the Department of Trade, Tourism and Sport sets out certain types of restricted development which are permitted within the inner and outer Public Safety Zones.

The proposed relevant action relates to the operation of the permitted and existing runway system and does not constitute new development which may be restricted within this zone.

The County Development Plan was varied on 9th December 2019 (the Variation) to give effect to the new noise zones developed as part of the preparation of the Dublin Airport LAP 2020, the provision of specific noise related policy concerning noise from aircraft, road and rail and the removal of the Red Approach Area at the end of the airport's runways.

In addition to the introduction of new noise zones, the Variation to the County Development Plan included a number of new and updated objectives. In relation to the County Development Plan objectives listed above, the Variation deletes Objectives NP01 and replaces it with a new NP01 which states the following:

"Objective NP01

Implement the relevant spatial planning recommendations and actions of the Dublin Agglomeration Environmental Noise Action Plan 2018-2023 and the Noise Action Plan for Dublin Airport 2019-2023 (or any subsequent plan), working in conjunction with relevant statutory agencies."

In respect of noise, the variation provides for four noise zones at the airport, namely Zones A-D. The plan notes that:

'Three noise zones are shown in the Development Plan maps, Zones B and C within which the Council will continue to restrict inappropriate development, and Zone A within which new provisions for residential development and other noise sensitive uses will be actively resisted. An additional assessment zone, Zone D is also proposed to identify any larger residential developments in the vicinity of the flight paths serving the Airport in order to promote appropriate land use and to identify encroachment.'

Table 6-2 below represents the contents of table 7.2 of the variation which sets out the four aircraft noise zones and the associated objective of each zone along with an indication of the potential noise exposure from operations at Dublin Airport. The zones are based on potential noise exposure levels due to the airport using either North Runway or the existing southern runway for arrivals or departures.

The noise zoning system has been developed with the overarching objective to balance the potential impact of aircraft noise from the Airport on both external and internal noise amenity. This allows for noise impacts on development, which may be brought forward in the vicinity of the Airport's flight paths, to be identified and considered as part of the planning process. The focus of the noise zones is to ensure that the impact of noise on future residential development and other sensitive receptors such as schools, hospitals etc is appropriately considered during the planning stage and that new development is appropriately designed to pertinent standards as well as guidance in relation to planning and noise, namely:

- National Planning Framework 2040, DHPLG, February 2018;
- ProPG: Planning & Noise –New Residential Development, May 2017;
- British Standard BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'; and

- ICAO guidance on Land-use Planning and Management in Annex 16, Volume I, Part IV and in the ICAO Doc 9184, Airport Planning Manual, Part 2 —Land Use and Environmental Control.

Table 6-2 Table 7.2 from the Variation to the Fingal Development Plan is as follows:

Zone	Indication of Potential Noise Exposure during Airport Operations	Objective
D	≥ 50 and < 54 dB $L_{Aeq, 16hr}$ and ≥ 40 and < 48 dB L_{night}	**To identify noise sensitive developments which could potentially be affected by aircraft noise and to identify any larger residential developments in the vicinity of the flight paths serving the Airport in order to promote appropriate land use and to identify encroachment.** *All noise sensitive development within this zone is likely to be acceptable from a noise perspective. An associated application would not normally be refused on noise grounds, however where the development is residential-led and comprises non- residential noise sensitive uses, or comprises 50 residential units or more, it may be necessary for the applicant to demonstrate that a good acoustic design has been followed.* *Applicants are **advised** to seek expert advice.*
C	≥ 54 and < 63 dB $L_{Aeq, 16hr}$ and ≥ 48 and < 55 dB L_{night}	**To manage noise sensitive development in areas where aircraft noise may give rise to annoyance and sleep disturbance, and to ensure, where appropriate, noise insulation is incorporated within the development** *Noise sensitive development in this zone is less suitable from a noise perspective than in Zone D. A noise assessment must be undertaken in order to demonstrate good acoustic design has been followed.* *The noise assessment must demonstrate that relevant internal noise guidelines will be met. This **may** require noise insulation measures.* *An external amenity area noise assessment **must** be undertaken where external amenity space is intrinsic to the development's design. This assessment should make specific consideration of the acoustic environment within those spaces as required so that they can be enjoyed as intended. Ideally, noise levels in external amenity spaces should be designed to achieve the lowest practicable noise levels.* *Applicants are **strongly advised** to seek expert advice.*
B	≥ 54 and < 63 dB $L_{Aeq, 16hr}$ and ≥ 55 dB L_{night}	**To manage noise sensitive development in areas where aircraft noise may give rise to annoyance and sleep disturbance, and to ensure noise insulation is incorporated within the development.** *Noise sensitive development in this zone is less suitable from a noise perspective than in Zone C. A noise assessment **must** be undertaken in order to demonstrate good acoustic design has been followed.* *Appropriate well-designed noise insulation measures **must** be incorporated into the development in order to meet relevant internal noise guidelines.* *An external amenity area noise assessment **must** be undertaken where external amenity space is intrinsic to the developments design. This assessment should make specific consideration of the acoustic environment within those spaces as required so that they can be enjoyed as intended. Ideally, noise levels in external amenity spaces should be designed to achieve the lowest practicable noise levels.*

Zone	Indication of Potential Noise Exposure during Airport Operations	Objective
		*Applicants **must** seek expert advice.*
A	≥ 63 dB $L_{Aeq, 16hr}$ and/or ≥ 55 dB L_{night}	**To resist new provision for residential development and other noise sensitive uses.** *All noise sensitive developments within this zone may potentially be exposed to high levels of aircraft noise, which may be harmful to health or otherwise unacceptable. The provision of new noise sensitive developments will be resisted.*

Notes:
'Good Acoustic Design' means following the principles of assessment and design as describedin ProPG: Planning & Noise – New Residential Development, May 2017).

Internal and External Amenity and the design of noise insulation measures should follow the guidance provided in British Standard BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'

6.4.2 Dublin Airport Local Area Plan (LAP)

A new LAP was published in January 2020. This new LAP recognises that *'Dublin Airport has grown significantly in size and importance since the adoption of the last LAP in 2006'*. At page 2, the LAP also recognises that the airport is of *'vital importance to the Irish economy and acts as the principal international gateway for trade, inward investment and tourism'*. The LAP also notes *that 'the Airport facilitates Ireland's integration with Europe and aids in attracting foreign direct investment'*.

The LAP sets out the robust policy framework in place at national, regional and now local level supporting the continued growth of Dublin Airport including its development as a secondary hub airport.

The LAP sets out a number of Key Strategic Objectives and aims to guide the future development and growth of Dublin Airport. These key objectives support the proposed relevant action and relate to the following:

- Support for airport safeguarding.
- Support the continued sustainable growth of Dublin Airport and connectivity as a hub airport whilst ensuring protection of the environment.
- Support the timely delivery of required infrastructure to facilitate airport growth.
- Support the growth of the Airport as a major economic driver for the region.
- Support continued communication between the Airport and neighbouring communities to protect community amenity and mitigate potential impact from airport growth in the interests of long-term sustainability.

The LAP recognises the NAP and notes that its states that:

'To ensure future connectivity and to deliver growth, it will be important that the State airports and Dublin Airport in particular, have sufficient capacity and runways of sufficient length to enable services to operate to global emerging markets without weight restriction '

and

'A specific level specific level of airport infrastructure, including terminal and runway capacity as well as surface access is required to support the development of Dublin Airport as a secondary hub'.

Section 7.2.2 of the LAP specifically relates to Runways. This section states the following objective which supports the proposed relevant action

> *"OBJECTIVE RW01*
>
> *Facilitate the operation of runways at Dublin Airport in line with current operational procedures, as determined by way of existing planning permissions or as otherwise determined in line with the requirements of the Aircraft Noise (Dublin Airport) Regulation Act 2019."*

The LAP dedicates an entire Section (section 9.1) to noise. In this section it notes the following:

"The Dublin Airport LAP is a land use plan for the purposes of effective land-use planning and safeguarding the use of the Airport. Noise zones relating to Dublin Airport have been in place for many years to aid land use planning. Since the publication of previous noise zones in 2005, and over the last decade, further evidence has emerged that has updated understanding of how aircraft noise can affect health and quality of life. With the north runway set to become operational in 2022, updated information is available relating to aircraft noise performance and flight paths. For these reasons, it was considered appropriate to update the noise zones for Dublin Airport to allow for more effective land use planning for development within airport noise zones.

The updated noise zones are set out in Fig. 9.1. Dublin Airport Noise Zones and policies relating to development in Noise Zones are set out in Variation No. 1 to the Fingal Development Plan 2017 - 2023." (Fig 6.2 below).

The proposed relevant action will ensure that the airport is able to maintain its current flight services that provide connectivity to mainland Europe, in particular, the proposed relevant action will ensure that the airport can meet the early morning and late night demand for take-off and landing that is required to ensure that flights leaving Ireland in the early morning can land at their European destination at the start of the working day. The proposed relevant action does not include any physical works, therefore there is limited opportunity for the proposed relevant action to contradict the stated objectives and policies of the LAP, notwithstanding this, the proposal will safeguard the night time usage of the runway for future growth.

For the above-mentioned reasons, it is considered that the proposed relevant action is fully aligned with the Dublin Airport LAP 2020.

6.4.3 Noise Action Plan for Dublin Airport (2019 – 2023)

The Noise Action Plan for Dublin Airport 2019 -2023 (Noise Action Plan) prepared under the Environmental Noise Regulations 2006 was adopted by FCC in December 2018. The Noise Action Plan is designed to manage noise issues and effects associated with existing operations at Dublin Airport. The Noise Action Plan sets out proposed actions including the following relating to land use planning and management:

- Keep under review land-use policies in relation to aircraft noise through the review of existing land use planning policy in so far as it relates to Dublin Airport.
- Monitor noise encroachment associated with Dublin Airport to ensure that land use planning policy is appropriately informed as it relates to Dublin Airport

The LAP and the above-mentioned Variation to the County Development Plan provides the land use planning framework to achieve these actions.

The Noise Action Plan requires the impact of noise generated from other aviation related sources (for example ground engine testing, maintenance, etc.) within the Airport lands to also be considered with regard to adjoining land uses and amenities. Section 7.2 of the Noise Action Plan includes a list of actions to be taken over the duration of the Noise Action Plan.

The application material for the proposed Relevant Action has been prepared fully in line with the actions contained within the Noise Action Plan and the Regulation 598 Assessment submitted with this application identifies where application actions within the Noise Action Plan have been addressed.

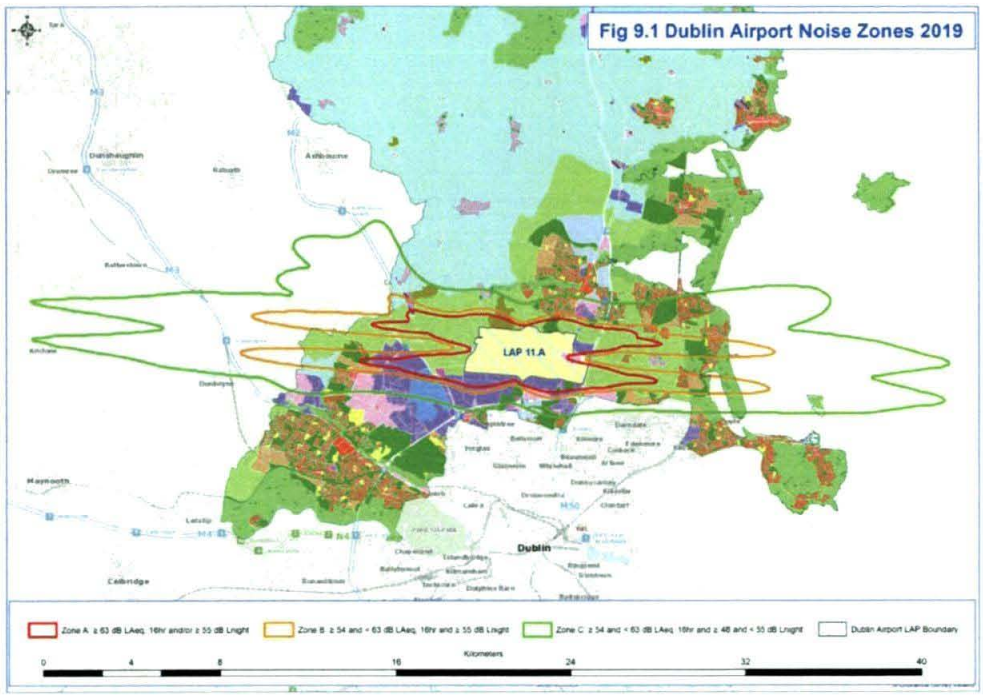


Figure 6-2 Extract of figure 9.1 from Dublin Airport Local Area Plan

6.5 Planning History

Planning permission was granted for North Runway in 2007 in ABP File Ref PL06F.217429 and contained 31 planning conditions. Two of these planning conditions (Conditions 3(d) and 5) related to operating restrictions on the use of the runways and overall airport operations at night. These are due to come into force once North Runway is operational. In addition, Condition 4 of the permission introduces a restriction on the use of the cross-wind runway (16/34). For avoidance of doubt there is no intention to apply to review Condition 4.

Condition 3(d) states that: Runway 10L 28R shall not be used for take-off or landing between 2300 hours and 0700 hours

Condition 5 states that: the average number of night time aircraft movements at the airport shall not exceed 65/night (between 2300 hours and 0700 hours) when measured over the 92day modelling period.

The origin of these conditions relates to information presented as part of the North Runway application. In particular, the Board asked the daa to outline the number of night-time flights (between 23:00 and 7:00) on the Southern Runway (Runway 10/28) at that time and into the future. daa responded that when preparing the EIS in 2004 there were 45 flights at night-time on Runway 10/28. They noted that this would grow to 65 flights on Runway 10/28 without the northern runway (Constrained case) and 95 flights if the northern runway were permitted but not used between 2300 and 0700 (Unconstrained case). daa clearly stated that the constrained case was conservatively low and that "A greater relative growth could have been assumed for night-time traffic in the constrained case as the relatively higher scarcity of daytime slots might cause airlines to modify schedules to include more night-time activity to compensate". This approach would reduce the difference between the constrained case and the unconstrained case but was not used as it would not represent a credible worst case for the assessment of impacts.

The Board chose to impose the limit of 65 no. flights (Constrained scenario) which is based on aircraft movement forecasts without North Runway operating.

When North Runway is operational, the existing runway will be re-designated as runway 10R/28L (South Runway) and North Runway will be designated as 10L/28R.

Condition 5 of the grant of planning states that: On completion of construction of the runway hereby permitted, the average number of night time aircraft movements at the airport shall not exceed 65/night (between 2300 hours and

0700 hours) when measured over the 92-day modelling period as set out in the reply to the further information request received by ABP on the 5th day of March 2007.

It is important to note that although Condition 5 states *'the average number of night-time aircraft movements at the airport shall not exceed 65/night'* this must be read in conjunction with Condition 3d and 4 which limit the use of North Runway and Runway 16/34 at night.

6.6 Conclusion

Since the 2007 planning permission was granted, Dublin Airport has experienced a strong sustained growth trajectory, with the current runway at capacity during peak times in 2019. This included levels of demand for night flights (23:00-07:00) at over 100/night in 2019, with 113/night associated with regularly scheduled services on a typical busy Summer day of that year.

Notwithstanding this, as a result of the Covid-19 Pandemic, as per all other international airports, Dublin Airport has seen a significant drop in air traffic movements and passenger numbers. However, strong sustained growth is expected to return post pandemic. In order to forecast the future growth post Covid-19, future forecasts have been undertaken by Mott McDonald on behalf of daa and are included with the application for planning permission. The forecasts identify that 108/night movements will be required in 2022/23 to sustain the airport's rebound, rising to 113/night when the airport returns to 32 million passengers per annum (mppa) in around 2025.

The operating restrictions imposed by Conditions 3(d) and 5 will impact the on movements specified above (specifically Condition 5) and subsequently the airport's ability to meet future demand. As such, the proposed relevant action seeks to amend and replace these operating restrictions.

The proposed relevant action is fully in compliance with multi-governmental strategic objectives and policies that seek to facilitate the growth of Dublin Airport and foster the airports connectiveness to the UK, Europe and wider global environment. By comparison, the existing permitted operating restrictions which the planning application seeks to amend/replace run contrary to these strategic objectives and policies.

Chapter 07: Population and Human Health

07

7. Population and Human Health

7.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) details the findings of an assessment of the likely significant effects on population and human health as a result of the proposed Relevant Action.

This assessment and EIAR chapter have been prepared by AECOM.

The appraisal of likely significant effects of the proposed Relevant Action on population and human health has been conducted by reviewing the current socio-economic environment and the potential impact on this environment at multiple spatial scales.

The proposed relevant action does not seek any amendment of conditions of the North Runway Planning Permission governing the general operation of the runway system (i.e., conditions which are not specific to night-time use, namely conditions no. 3 (a), 3(b), 3(c) and 4 of the North Runway Planning Permission) or any amendment of permitted annual passenger capacity of the Terminals at Dublin Airport. Condition no. 3 of the Terminal 2 Planning Permission (Fingal County Council Reg. Ref. No. F04A/1755; ABP Ref. No. PL06F.220670) and condition no. 2 of the Terminal 1 Extension Planning Permission (Fingal County Council Reg. Ref. No. F06A/1843; ABP Ref. No. PL06F.223469) provide that the combined capacity of Terminal 1 and Terminal 2 together shall not exceed 32 million passengers per annum.

This assessment will focus on impacts on:

- Amenity and local communities (effects on amenity uses of a site or of other areas in the vicinity); and
- Human health and well-being (to consider the impact of the proposed Relevant Action on the health and wellbeing of the communities).

This chapter describes the national and local policy and legislation context; the relevant literature on potential impacts on population and human health; assessment methods used; baseline conditions; potential direct and indirect population impacts during the operational phase of the proposed Relevant Action; potential human health and well-being impacts during the operational phase of the proposed Relevant Action; mitigation measures; and relevant residual effects.

The result of the permitted / constrained scenario coming into effect when North Runway becomes operational in 2022, is a loss of air traffic movements and associated loss of 1.1m passengers per year (-3.5%) and a cumulative loss over the 4-year period 2022-2025 of 4.3m passengers. The net effect of the proposed Relevant Action would be to facilitate an increase in the number of flights permitted to take off from, or land at, Dublin Airport at night, which would enable the lost 1.1million passengers to be regained annually in the post-COVID-19 recovery period.

Further information of the economic impact of the permitted / constrained scenario, and the proposed Relevant Action (ie the proposed / unconstrained scenario) is provided in Chapter 3: *Need for the Project*, and the InterVISTAS report which is provided as part of the planning application package.

7.2 Legislation, Guidance and Planning Policy Context

7.2.1 National Guidance

The following national legislation is directly applicable to the proposed Relevant Action in terms of the assessment of population and human health effects:

- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2017);
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2017b);
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2002); and
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2002)

7.2.2 National Planning Policy

7.2.2.1 National Planning Framework: Project Ireland 2040

The National Planning Framework: Project Ireland 2040 is the Government's high-level strategic plan for shaping the future growth and development of Ireland to the year 2040 (Government of Ireland, 2018). It is a framework to guide public and private investment, to create and promote opportunities for the people of Ireland, and to protect and enhance the environment.

Chapter 6: People, Homes and Communities of the National Planning Framework: Project Ireland 2040 sets out the following themes of relevance to Population and Human Health:

- 'Quality of Life and Place';
- 'Healthy Communities';
- 'Diverse and Inclusive Ireland';
- 'Age Friendly Communities';
- 'Childcare, Education and Life Long Learning'; and
- 'Housing',

Within Section 6.2: 'Healthy Communities', it is noted how specific health risks, such as include heart disease, respiratory disease, mental health, obesity and other injuries, can be influenced by spatial planning. It is also suggested that by taking a whole-system approach to addressing the many factors that impact on health and wellbeing and which contribute to health inequalities, and by empowering and enabling individuals and communities to make healthier choices, it will be possible to improve health outcomes, particularly for the next generation of citizens.

The following objectives are of relevance to this population and human health assessment:

National Policy Objective 26: *"Support the objectives of public health policy including Healthy Ireland and the National Physical Activity Plan, though integrating such policies, where appropriate and at the applicable scale, with planning policy".*

7.2.2.2 Healthy Ireland Framework 2019 – 2025

The Healthy Ireland Framework sets out a vision to create "A Healthy Ireland, where everyone can enjoy physical and mental health and wellbeing to their full potential, where wellbeing is valued and supported at every level of society and is everyone's responsibility".

The Healthy Ireland Framework is designed to bring about real, measurable change and is based on an understanding of the determinants of health. Health and wellbeing are affected by all aspects of a person's life; economic status, education, housing, the physical environment in which people live and work.

The Healthy Ireland Framework was launched in 2013 and presents four central goals for improved health and well-being (FCC, 2017):

- *"increase the proportion of people who are healthy at all stages of life;*
- *Reduce health inequalities;*
- *Protect the public from threats to health and well-being; and*
- *Create an environment where every individual and sector of society can play their part in achieving a healthy Ireland."*

The Healthy Ireland Framework states that *"The area of environment and health, in its broadest sense,* comprises those aspects of human health, disease, and injury that are determined or influenced by factors in the environment. This includes not only the study of the direct pathological effects of various chemical, physical, and biological agents, but also the effects on health of the broad physical and social environment, which includes housing, urban development, land use and transportation, industry, and agriculture". As such, reaffirming the need for the proposed Relevant Action to be considered in respect of its impacts on health.

7.2.3 Local Planning Policy

7.2.3.1 Fingal Development Plan 2017-2023

Fingal County Council (FCC) adopted the Fingal Development Plan 2017-2023 (FCC, 2017) in March 2017 which sets out the policies and objectives to achieve the vision for the County over the plan period. The Development Plan aims to "*develop and improve, in a sustainable manner, the social, economic, environmental and cultural assets of the County*".

The following objectives are of relevance to this population and human health assessment:

- Objective PM69 in Chapter 3 seeks to "Ensure that proposals do not have a detrimental effect on local amenity by way of traffic, parking, noise or loss of privacy of adjacent residents".
- Objective ED31 in Chapter 6 aims to provide the infrastructure and facilities to allow Dublin Airport to operate at its maximum sustainable potential, *"whilst taking into account the impact on local residential areas, and any negative impact such proposed developments may have on the sustainability of similar existing developments in the surrounding area"*. This will be key for the assessment.
- Objective DA07 in Chapter 7 seeks to *"Strictly control inappropriate development and require noise insulation where appropriate within the Outer Noise Zone, and actively resist new provision for residential development and other noise sensitive uses within the Inner Noise Zone, as shown on the Development Plan maps, while recognising the housing needs of established families farming in the zone. To accept that time based operational restrictions on usage of a second runway are not unreasonable to minimize the adverse impact of noise on existing housing within the inner and outer noise zone"*.
- Objective DA09 in Chapter 7 seeks to *"Ensure that aircraft-related development and operation procedures proposed and existing at the Airport consider all measures necessary to mitigate against the potential negative impact of noise from aircraft operations (such as engine testing, taxiing, taking off and landing), on existing established residential communities, while not placing unreasonable, but allowing reasonable restrictions on airport development to prevent detrimental effects on local communities, taking into account EU Regulation 598/2014 (or any future superseding EU regulation applicable) having regard to the 'Balanced Approach' and the involvement of communities in ensuring a collaborative approach to mitigating against noise pollution"*.

The Fingal Development Plan also includes a map indicating zoning land uses across the County. This map and the following objectives are relevant to the overall assessment:

- Zoning Objective *'CI' Community Infrastructure aims to "provide for and protect civic, religious, community, education, health care and social infrastructure"*. This objective will advise land use assessment.
- Zoning Objective 'DA' Dublin Airport in aims to *"ensure the efficient and effective operation and development of the airport"* in line with the Airport Local Area Plan. Within the vision for Dublin Airport, the Fingal Development Plan states that *"minor extensions or alterations to existing properties located within the Airport Area which are not essential to the operational efficiency and amenity of the airport may be permitted, where it can be demonstrated that these works will not result in material intensification of land use"*. This objective and vision will be accounted for throughout the assessment.

Zoning Objective 'HA' High Amenity in Chapter 11 aims to protect and enhance the highly sensitive amenity areas and scenic locations "*from inappropriate development and reinforce their character, distinctiveness and sense of place*". This objective will be considered in the assessment of amenity effects.

7.2.3.2 Dublin Airport Local Area Plan

FCC published the Dublin Airport Local Area Plan in January 2020. The Dublin Airport Local Area Plan identifies various issues of relevance and establishes the principles for future development in the area.

Within Chapter 9 Environment & Community, Figure 9.1 displays the updated Dublin Airport Noise Zones 2019. The accompanying text in Section 9.1 on noise details that these zones have been updated to allow for more effective land use planning within airport noise zones, using evidence on how aircraft noise can affect health and quality of life. Therefore, this text and map will be considered for the amenity and health and well-being assessments.

Appendix 1: Strategy for St. Margaret's Special Policy Area provides a plan and specific policies for the closest settlement to Dublin Airport. This strategy will be considered in the amenity and health and well-being assessment.

7.3 Assessment Methodology

7.3.1 Study Area

As there is no national guidance available on identifying an appropriate study area to focus the assessment of population and human health, the study area for the population and human health assessment has considered the area of land that may be affected by the proposed Relevant Action. It should be noted, however, that it is not always possible to determine the catchment area for community facilities. Residents of an area may utilise facilities located within different electoral divisions, counties or regions without regard for statutory boundaries.

7.3.2 Methodology for Determining Baseline Conditions and Sensitive Receptors

7.3.2.1 Baseline Conditions

A baseline community profile will help to establish an in-depth understanding of the population affected by the proposed Relevant Action, identifying potentially vulnerable groups. In order to gather baseline information pertaining to employment, demographics, human health and local amenities, a robust desktop study has been undertaken, drawing on information from the following sources:

- Central Statistics Office (CSO);
- Fingal County Council; and
- The 2016 Pobal HP Deprivation Index for Small Areas (SA).

The baseline for the Population and Human Health assessment was supported by a site visit undertaken by AECOM in August 2019. The site visit helped to develop a broader understanding of the local context and land uses in the local area. Key receptors, such as residential areas, community facilities, leisure facilities and walking routes, in the local area were visited during the site visit.

Baseline data collection for the population and human health assessment has therefore considered the communities and areas of land which may potentially be impacted by the proposed Relevant Action. The impact areas for certain impacts such as human health, amenities and community facilities, and local land uses have been informed by other assessments (Aircraft Noise and Vibration, Ground Noise and Vibration, Air Quality and Climate Change) during the assessment stage of the EIAR.

7.3.3 Methodology for Determining Construction Effects

7.3.3.1 Amenity and Local Communities

As the proposed Relevant Action will result in no changes to the design or construction of the North Runway, there will be no changes to the physical infrastructure of the North Runway. On that basis, the assessment of construction phase impacts on amenity and local communities has been **scoped out** of the EIAR.

7.3.3.2 Human Health and Well-being

As the proposed Relevant Action will result in no changes to the design or construction of the North Runway, there will be no changes to the physical infrastructure of the North Runway. On that basis, the assessment of construction phase impacts on human health and well-being has been **scoped out** of the EIAR.

7.3.3.3 Methodology for Determining Operational Effects

Effects on amenity and local communities, employment opportunities and human health are described using the criteria provided in EPA guidance (EPA, 2017 and EPA, 2017b), European Commission guidance (EC, 2017) and the London HUDU Rapid Health Impact Assessment Tool (London Healthy Urban Development Unit, 2019), as detailed in the following sub-sections.

7.3.3.4 Amenity and Local Communities

The assessment on amenity and local communities is concerned with how the proposed Relevant Action potentially impacts on the ability of residents and users of community and recreational facilities to achieve enjoyment and/or quality of life.

Assessing the impact of the proposed Relevant Action on amenity and local communities has taken into account the combined residual significant effects from other assessment topics (***Chapter 13. Air Noise and Vibration, Chapter 14. Ground Noise and Vibration, Chapter 10. Air Quality*** and ***Chapter 11. Climate and Carbon***.) which

could affect people's enjoyment of a community facility, public space or residential property. Due to the nature of the proposed Relevant Action, the amenity and local communities assessment only considers the indirect effects arising from the combined residual significant effects from other topics on the amenity of properties and/or community resources in the study area. As there is no physical construction activity as a result of the proposed Relevant Action, direct effects (i.e. properties and/or facilities being cut off or split) are not considered within the assessment on amenity and local communities.

Some assessments within this EIAR have considered a variety of scenarios associated with the proposed Relevant Action. Where this chapter of the EIAR draws upon information from other chapters which have considered multiple scenarios, the worst-case scenario has been considered. For the purpose of this assessment, we have assumed a reasonable worst-case scenario from a noise and air quality perspective in that the comparison is made between the proposed / unconstrained 2025 Relevant Action and the permitted / constrained 2025 Baseline.

In assessing this, a descriptive approach has been used which gives an overall indication of the change i.e. positive, negative/adverse or neutral, in the amenity of the receptor. As set out in Table 7-2, the assessment is based on professional judgement and uses a four-point scale of high, medium, low and very low. Depending on the type of receptor being assessed, the magnitude of effect is based on the number of users and the extent to which these users experience impacts on their amenity.

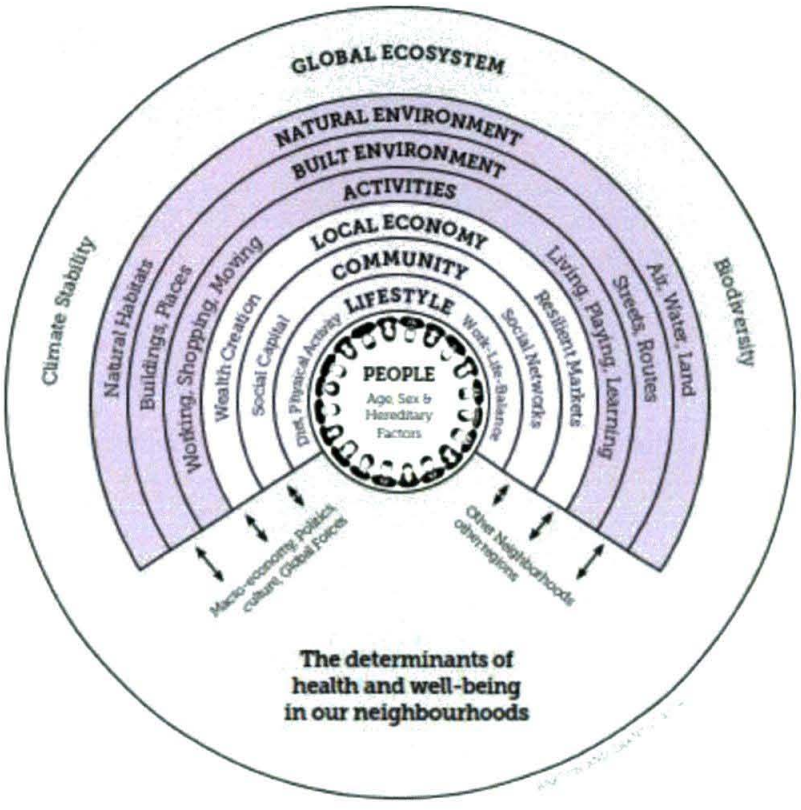
The assessment aligns with the relevant aspects of the Environmental Protection Agency's *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017), *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2017b) as well as the European Commission's guidance document *Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report* (EC, 2017).

7.3.3.5 Human Health and Well-being

The human health and well-being assessment includes impacts on the health of residents of properties and users of community resources in the study area. Whilst relevant guidance from the Institute of Public Health in Ireland (IPH), specifically the *Health Impact Assessment Guidance* (Institute of Public Health in Ireland, 2009), has been considered, there is no consolidated methodology or practice for describing effects on human health in EPA guidance. The impacts of the proposed Relevant Action on human health will therefore be assessed qualitatively using the health and well-being determinants set out in the *London HUDU Rapid Health Impact Assessment Tool* (London Healthy Urban Development Unit, 2019). The *London HUDU Rapid Health Impact Assessment Tool* is a checklist approach which provides a broad overview of the potential health impacts and is applicable to a wide range of proposals that considers impacts on a range of health determinants. The checklist is split into 11 broad determinants and is based on the World Health Organisation (WHO) publication 'Healthy Urban Planning' (Barton and Tsourou, 2000).

The WHO Europe defines health as *"a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity"* (WHO, 2020). Consequently, public health encompasses general wellbeing, not just the absence of illness. Some effects are direct and obvious, others are indirect, while some may be synergistic, with different types of impact acting in combination. In keeping with this definition, this assessment considers the potential impacts of the proposed Relevant Action on physical, mental and social health.

Factors that have the most significant influence on the health of a population are called 'determinants of health'; these include an individual's genetics and their lifestyle, the surrounding environment, as well as political, cultural and societal issues. The interrelationship between these factors is shown in .



Source: Barton and Grant (2006)

Figure 7-1: Social determinants of health

An initial scoping exercise was undertaken to determine the health determinants within the *London HUDU Rapid Health Impact Assessment Tool* (London Healthy Urban Development Unit, 2019) which are relevant to this assessment. The following health determinants in the *London HUDU Rapid Health Impact Assessment Tool* (London Healthy Urban Development Unit, 2019) are associated with construction activities or the provision of new physical infrastructure and were not deemed to be of relevance to the proposed Relevant Action and therefore are not assessed further:

- Housing design and affordability;
- Access to health and social care services and other social infrastructure;
- Accessibility and active travel;
- Crime reduction and community safety;
- Access to healthy food;
- Social cohesion and inclusive design; and
- Minimising the use of resources.

The health determinants which will be assessed as part of this chapter are listed below:

- Air quality, noise and neighbourhood amenity; and
- Climate change.

A literature review further considers existing scientific evidence in order to identify the determinants of relevance to the proposed Relevant Action. This literature review provides scientific evidence which supports assumptions made about the potential health impacts of the proposed Relevant Action.

HUDU advises that the tool is generic and should be adapted to local circumstances. This assessment of human health and well-being effects includes the likely direct, indirect and cumulative effects of the proposed Relevant

Action. Potential impacts on the health and well-being of the existing local community and residents has been considered, in particular for more vulnerable groups (such as children and the elderly). Health inequalities have also been considered. Mitigation and enhancement measures for the proposed Relevant Action (some of which may have already been considered through the development of the proposed Relevant Action) have been considered and key indicators for monitoring health and well-being impacts moving forward have been established. This qualitative approach does not draw on specific receptors and significance levels and will not seek to conclude the significance of impacts.

7.3.4 Classification of Effects and Significance Criteria

7.3.4.1 Amenity and Local Communities

For amenity and local communities, conclusions on the classification of effects have been made by assessing the magnitude of impact, combined with the sensitivity of resources and receptors to these impacts.

Table 7-1: Type of Effects

Type of Effects	*Magnitude of Effect*
Beneficial	An impact that has a potential advantageous or beneficial effect on receptors within a specific geographical area, which may be minor, moderate, or major in effect.
Negligible	An impact that is expected to have imperceptible effects on receptors within a defined area.
Adverse	An impact that is expected to have a disadvantageous or adverse effect on receptors within a specific geographical area, which may be minor, moderate or major in effect.
No effect	An impact that is likely to have no effect on an area or local receptors.

Duration of effect is also considered, with more weight given to permanent changes than to temporary ones.

The impact assessment has been undertaken in accordance with the broad magnitude of impact and sensitivity of receptor definitions summarised in Table 7-2 and Table 7-3.

Table 7-2: Magnitude of Impact Criteria

Magnitude of Impact	*Magnitude of Effect*
High	An impact that is expected to have considerable adverse or beneficial effects on receptors. Such impacts will typically affect large numbers of residents, users, businesses or workers. High magnitude impacts will typically be long-term in nature, resulting in the permanent change of the study area's baseline conditions.
Medium	An impact that is expected to have a moderate effect on receptors. Such impacts will typically have a noticeable effect on a limited number of residents, users, businesses or workers, and will lead to a permanent (but not drastic) change to the study area's baseline conditions.
Low	An impact that is expected to affect a small number of residents, users, businesses or workers. Or an impact that may affect a larger number of receptors but without materially changing the study area's baseline conditions. Such impacts are likely to be temporary in nature.
Very Low	An impact that is likely to be temporary in nature, or which is anticipated to have a slight effect on the residents, users, businesses or workers.

Table 7-3: Sensitivity of Receptors

Sensitivity of Receptors	*Magnitude of Effect*
High	Receptor is likely to be directly affected. Receptor is well placed to take advantage of beneficial impacts, and/or is not well placed to deal with any adverse impacts.

Medium	Receptor is likely to be indirectly affected. Average ability to maximise beneficial impacts or cope with adverse impacts.
Low	Receptor is unlikely to benefit. Receptor is not well placed to take advantage of beneficial impacts, and/or is well placed to deal with any adverse impacts.

Once the magnitude of the effect has been identified, this can be cross-referenced with the importance of the sensitivity of the receptor to derive the overall significance of impact as per the EPA guidelines (EPA, 2017 and EPA 2017b). By bringing together magnitude and sensitivity, the assessment considers the classification of the effects as outlined in Table 7-4. Moderate and Major effects are considered to be significant. Minor and Negligible effects are considered to be not significant.

Table 7-4: Significance Criteria

Sensitivity of Receptors	*Magnitude of Effect*			
	High	Medium	Low	Very Low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible

7.3.4.2 Human Health and Well-being

The assessment of human health and well-being is a qualitative rather than quantitative assessment, due to the diverse nature of health determinants and health outcomes which are assessed. Although the assessment of human health effects describes the likely qualitative health outcomes, it is not possible to quantify the severity or extent of the effects which give rise to these impacts. As such, the potential health impacts are described as outlined in

Table 7-5, based on broad categories for the qualitative effects identified. Where an effect has been identified, actions have been recommended to mitigate negative impact on health, or opportunities to enhance health benefits. As detailed in ***Chapter 13. Air Noise and Vibration*** and ***Chapter 14. Ground Noise and Vibration***, embedded mitigation to reduce these effects or measures to enhance certain benefits already form part of the proposed Relevant Action and the assessment has considered these impacts as such.

Table 7-5: Human health impact categories

Impact category	*Impact symbol*	*Description*
Positive	+	A beneficial impact is identified
Neutral	0	No discernible health impact is identified
Negative	-	An adverse impact is identified
Uncertain	?	Where uncertainty as to the overall impact

7.3.5 Limitations and Assumptions

This population and human health assessment is based on professional judgement and takes into account both the adverse and beneficial impacts that the proposed Relevant Action can have upon existing and surrounding receptors. It provides a broad, high level indication of effects, reporting on the potential effects to people and the local community.

Assessment has been based on information about the proposed Relevant Action available at the time when the chapter was drafted. It has drawn upon other specialist topic inputs to aid the assessment of the impact of the proposed Relevant Action on population and human health receptors (***Chapter 13. Air Noise and Vibration, Chapter 14. Ground Noise and Vibration, Chapter 10. Air Quality*** and ***Chapter 11. Climate and Carbon***.)

With regards to ground noise and vibration impacts associated with the proposed Relevant Action, it should be noted that the residual effects within ***Chapter 14. Ground Noise and Vibration*** considers the cumulative effects of the proposed Relevant Action and Apron 5H (as defined in Chapter 14) schemes but not the residual effects of the proposed Relevant Action only. Therefore, this assessment has utilised the pre-residual effects assessment for ground noise and vibration impacts (***Chapter 14. Ground Noise and Vibration)*** which means that the benefit of mitigation is not accounted for, although the effect is unlikely to be substantive, this does therefore represent the worst case assessment.

Dwellings have been used to estimate population as part of ***Chapter 13. Air Noise and Vibration*** and ***Chapter 14. Ground Noise and Vibration***, hence results are presented within this chapter as the number of people rather than dwellings.

Community resources are mentioned expressly in the environmental baseline only where they contribute to the local context or where they may be affected by the proposed Relevant Action. Consequently, not all community resources within the study area are mentioned.

Information in the baseline related to demographics and the health profile of the population in the study area uses statistics from the census. Four years have passed since the previous census was published (2016).

7.4 Literature Review

As set out by the Institute of Public Health in Ireland, "A literature review should be undertaken to find evidence which supports or refutes the assumptions made at the screening stage about the potential health impacts of the proposal" (Institute of Public Health in Ireland, (2009). Therefore, a literature review which focuses on the potential impacts of the proposed Relevant Action on human health and well-being has been carried out.

Initially, this literature review has considered whether there is sufficient evidence from within the London HUDU Rapid Health Impact Assessment Tool to support an association between the activities associated with the proposed Relevant Action and the relevant determinant of health. The potential effects on health determinants have been summarised in Table 7-6.

Table 7-6: Potential effects of activities associated with the proposed Relevant Action on health determinants

Activity associated with the proposed Relevant Action	Health determinant and potential impact
Increased frequency of emissions and noise exposure from additional aircraft movements and associated operations	***Air quality, noise and neighbourhood amenity*** *– the quality of the local environment can have a significant impact on physical and mental health. Pollution caused by construction, traffic and commercial activity can result in poor air quality, noise nuisance and vibration. Poor air quality is linked to incidence of chronic lung disease (chronic bronchitis or emphysema) and heart conditions and asthma levels of among children and young people. Noise pollution can have a detrimental impact on health resulting in sleep disturbance, cardiovascular and psycho-physiological effects. Good design and the separation of land uses can lessen noise impacts.*
Increased frequency of emissions from additional aircraft movements and associated operations	***Climate change*** *– there is a clear link between climate change and health. Local areas should prioritise policies and interventions that 'reduce both health inequalities and mitigate climate change' because of the likelihood that people with the poorest health would be hit hardest by the impacts of climate change.*

Source: London HUDU Rapid Health Impact Assessment Tool (2019)

Having identified the health determinants which have the potential to be impacted by the activities associated with the proposed Relevant Action; this literature review now provides additional evidence, based on existing scientific literature, to reaffirm such potential health impacts.

7.4.1 Air quality, noise and neighbourhood amenity

Based on the scientific literature reviewed and referenced throughout this Chapter, there is strong evidence for the adverse effects of air pollution, specifically particulate matter (PM) and nitrogen dioxide (NO_2), on human health. Exposure to air pollution - induced by aircraft, airside plant and vehicle movements - over several years can reduce life-expectancy, mainly due to an increased risk of cardiovascular and respiratory illness such as chronic obstructive pulmonary disease (Liu, Y., Yan, S., Poh, K., *et al.,* 2016) and lung cancer (Loomis, D., Grosse, Y., *et al.,* 2013), while short-term exposure can aggravate respiratory and cardiovascular conditions, and trigger asthma attacks (Orellano, P., Quaranta, N., Reynoso, J., *et al.* 2017) and premature deaths. The evidence is strongest for cardiovascular and respiratory effects, particularly in younger (Bell, M. L., Zanobetti, A. & Dominici, F., 2013) and older people (Braubach, M., Jacobs, D. E. & Ormandy, D. 2011). The evidence for population level changes in health outcomes due to concentrations of fine PM and NO_2 below statutory levels is more limited, but there is a general association of sufficient strength to warrant assessment and development of environmental measures to reduce emission levels to as low as reasonably practicable (Bell, M. L., Zanobetti, A. & Dominici, F., 2013).

Based on the scientific literature reviewed, the strength of evidence is strong for a direct causal relationship between noise disturbance and health outcomes and quality of life effects although this is dependent on the level of disturbance. Emerging from the evidence base are a number of key health outcomes, including noise annoyance, sleep disturbance, cardiovascular health, mental health, and children's learning.

Noise annoyance, commonly used within European policy to measure the quality of life impacts of noise exposure on communities around airports, is defined as disturbance, irritation, dissatisfaction and nuisance from environmental noise (Institute of Public Health in Ireland, 2005). Existing evidence displays a variation in the strength of the relationship between aircraft noise and annoyance which may be associated with differences in methodologies, operational factors (i.e. runway operations and night-flight operations) and non-acoustic factors. Studies of change in aircraft noise exposure, including studies of newly affected communities, have found that there is an excess-response in relation to the change in noise exposure, both for decreased and for increased aircraft noise exposure (Breugelmans, O., Houthuijs, D., van Kamp, I., *et al.* (2007); Brown, A. L., and van Kamp, I., 2009). Whilst there is a relationship between aircraft noise and annoyance, there is very little evidence evaluating the impact of operational interventions on annoyance (White, K., Arntzen, M., Walker, F., *et al.* 2017).

Sleep disturbance, potentially induced by aircraft noise, can, in the short-term, impair mood and cognitive performance (Basner, M., & McGuire, S., 2018 and Institute of Public Health in Ireland, 2005). The long-term effects of sleep disturbance can influence glucose metabolism, appetite regulation, memory immune response and endothelial dysfunction, which can act as precursors for high blood pressure, cardiovascular disease, diabetes and obesity (Basner, M., & McGuire, S., 2018 and Müller, U., Schreckenberg, D., Möehler, U *et al.* 2018). Measuring sleep is challenging as there is no one physical, physiological or psychological measure that is considered reliable. As such, there is little evidence evaluating the relationship between aircraft noise and sleep disturbance. However, a recent study utilised meta-analysis (including a study of the Docklands Light Railway (DLR)) to estimate exposure-response functions for the probability of sleep change as a result of aircraft noise and findings suggested that a relationship did exist (Basner, M., & McGuire, S., 2018).

Cardiovascular disease (CVD), a term used to describe an umbrella of health conditions such as Coronary Heart Disease (CHD), Ischaemic Heart Disease (IHD), Angina, heart failure, stroke, and Acute Myocardial Infarction (AMI), have been widely studied in relation to environmental noise. Many studies have found that it is biologically plausible that environmental noise exposure might influence CVD (Babisch, W., 2014; Munzel, T., and Daiber, A., 2018 and Munzel, T., Sorensen, M., Schmidt, F., *et al* 2018). It is hypothesised that heightened noise exposure can cause physiological stress reactions, which in turn can increase CVD risk factors (Institute of Public Health in Ireland, 2005). In regards to studies which have specifically assessed aircraft noise and cardiovascular outcomes, a number of studies have found small, but statistically significant effects, on a range of cardiovascular outcomes including AMI and CHD as well as risk factors including hypertensions and diabetes (Basner, M., Babisch, W., Davis, A., et al 2014; Kempen, E. V., Casas, M., Pershagen, G., *et al* 2018; Vienneau, D., Schindler, C., Perez, L., *et al* 2015).

Mental health and well-being is defined by the WHO as a 'state of well-being in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community'. Mental health and well-being is strongly influenced by socioeconomic status, age, gender, history of poor-mental health, and exposure to other life stressors (Gruebner, O., Rapp, M. A., Adli, M., *et al* 2017 and Clark, C., Pike, C., McManus, S., *et al.* 2012). This said, noise is thought to be an environmental stressor influencing mental health and well-being (Baudin, C., Lefevre, M., Champelovier, P., *et al.* 2018; Beutel, M. E., Junger, C., Klein, E. M., *et al.* 2016; Schreckenberg, D., Griefahn, B., and Meis, M., 2010). In regards to studies relating to aircraft noise, a number of studies have found evidence to suggest aircraft noise can

be linked to a number of mental health and well-being outcomes including anxiety and depressive disorders (Baudin, C., Lefevre, M., Champelovier, P., *et al.* 2018; Beutel, M. E., Junger, C., Klein, E. M., *et al.* 2016; Schreckenberg, D., Griefahn, B., and Meis, M., 2010).

In addition, there is a reasonable body of scientific evidence indicating that both actual and perceived neighbourhood amenity plays an important role in physical and mental health (Miller, W. D., Pollack, C. E. & Williams, D. R., 2011). Broadly, the literature indicates that environmental features of a neighbourhood, such as its attractiveness or pollution levels, affect the socio-economic position of residents, which in turn affects health and health inequalities (Egan, M., Tannahill, C., Petticrew, M., et al., 2008).

7.4.2 Climate Change

There is an existing evidence base which suggests that climate change has a wide range of implications for human health, including increased mortality and morbidity from extreme weather events, infectious diseases (waterborne, foodborne and vector-borne),diseases resulting from degraded air pollution and mental health (WHO, 2009). As climate change is multi-faceted, it is not possible for studies to attribute health outcomes to specific developments such as airports.

Various studies have assessed the likely future effects of climate change on various health outcomes induced by extreme weather events, including heat waves, storms, cyclone, fires and floods (McMichael, A.J., and Lindgren, E., 2011). Evidence suggests that in temperate countries, as summers become increasingly hotter and heat waves more frequent and severe, additional heat-related deaths will progressively overwhelm the number of deaths averted as a result of milder winters (Knowlton. K., Lynn. B., and Goldberg. R.A., et al., 2007 and Bambrick. H., Dear. K., Woodruff. R., *et al.,* 2008).

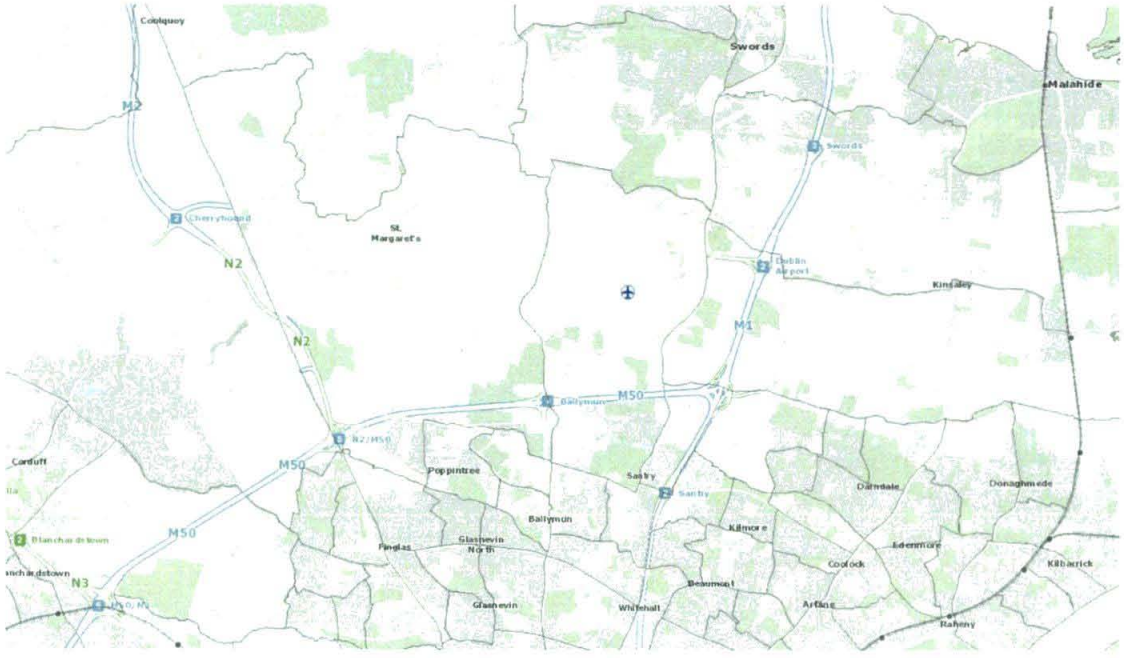
Evidence also suggests that rising temperatures also have implications on the formation and dispersal of various air pollutants. Ozone, a major urban pollutant, accumulates more readily from engine exhausts at higher temperatures. Studies have found that the mortality rate caused by Europe's 2003 heat wave was exacerbated by high temperatures and ozone formation (McMichael, A.J., and Lindgren, E., 2011 and Dear, K., Ranmuthugala, G., and Kjellström, T., *et al.* 2005).

Furthermore, extensions in the geographic range of several vector-borne infectious diseases or their vectors have been linked to rising temperatures induced by climate change. Evidence suggest that temperature, rainfall and humidity can influence the replication and viability of pathogens and vectors (McMichael, A.J., and Lindgren, E., 2011).

7.5 Baseline Conditions

This section establishes a comprehensive and coherent socio-economic profile of the area, including consideration of the labour market and health indicators. Dependent on the availability of data from the Central Statistics Office (CSO), the baseline section presents analysis of socio-economic indicators which provides the narrative and evidence base of the current status of Dublin Airport. Baseline analysis in this section sets the context for the potential impacts of the proposed Relevant Action.

Dublin Airport intersects the two Electoral Divisions (ED) of Airport and Dubber. Both EDs are located within the county of Fingal, which itself, is situated in the wider jurisdictions of the Dublin Regional Authority and the Eastern & Midland Regional Assembly.



Source: Central Statistics Office (Ireland) (2016), Census 2016

Figure 7-2: Electoral Division

This section establishes the current baseline with regards to the following characteristics relevant to the potential impacts of Dublin Airport:

- Population;
- Labour market indicators; including:
  - Participation rate and unemployment;
  - Education and skills;
  - Occupational profile; and
  - Income profile.
- Human health; and

Local community facilities and land uses.

7.5.1 Population

7.5.1.1 Population

As shown in Table 7-7, the resident population of the Airport ED was 5,018 whilst Dubber ED was 7,372 in 2016 (Central Statistics Office, 2016). Both the Airport ED and Dubber ED, where the airport is located, had a higher proportion of working age residents and lower proportion of retirement age (65+ years) in comparison to Fingal, Dublin Regional Authority, the Eastern & Midland Regional Assembly and the average for Ireland. In 2016, 3,823 (76.2%) of the residents in the Airport ED were aged between 15 and 64 years. Dubber ED had 5,160 (70.0%) residents aged between 15 and 64 years in 2016.

The proportion of working aged residents in both the Airport ED and Dubber ED was noticeably higher than the average recorded for Fingal (66.3%), Dublin Regional Authority (68.5%), the Eastern & Midland Regional Assembly (66.8%) and Ireland (65.5%) as a whole. In addition, the Airport ED had a smaller proportion of residents aged 14 years or under (15.0%) in comparison to Fingal (24.5%), Dublin Regional Authority (19.3%), the Eastern & Midland Regional Assembly (21.1%) and Ireland (21.1%). Dubber ED (26.8%) had the largest proportion of residents aged 14 years or under. The proportion of residents aged 65 years or older in the Airport ED (8.8%) and Dubber ED (3.2%) was smaller than the average for Fingal (9.1%), Dublin Regional Authority (12.2%), the Eastern & Midland Regional Assembly (12.0%) and Ireland (13.4%).

Table 7-7: Population by age, (2016).

	Airport ED		Dubber ED		Fingal County		Dublin Regional Authority		Eastern & Midland Regional Assembly		Ireland	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Aged 14 years or under	753	15.0	1,977	26.8	72,613	24.5	259,953	19.3	492,198	21.1	1,006,552	21.1
Aged 15-64 years	3,823	76.2	5,160	70.0	196,372	66.3	922,422	68.5	1,556,487	66.8	3,117,746	65.5
Aged 65 years or over	442	8.8	235	3.2	27,035	9.1	164,984	12.2	279,832	12.0	637,567	13.4
Total Population	**5,018**	-	**7,372**	-	**296,020**	-	**1,347,359**	-	**2,328,517**	-	**4,761,865**	-

Source: Central Statistics Office (Ireland) (2016), Census 2016.

7.5.1.2 Deprivation

The Podal HP Deprivation Index (Haase, T., and Pratschke, J. 2017) is the primary source for deprivation in Ireland by combining three dimensions of affluence or disadvantage (demographic profile, social class composition and labour market situation) to provide a Relative Index Score for every Small Area in Ireland. The Relative Index Scores are normally distributed around a bell-shaped curve to display the current levels of deprivation compared to other areas, with most areas clustered around the mean and comparatively fewer areas exhibiting extreme levels of affluence or deprivation. The eight classifications for deprivation range from extremely affluent to extremely disadvantaged. According to the latest data, the local authority of Fingal is classified as 'marginally above average' (5th least deprived rank out of 8 classifications) in 2016 with a relative score of 5.3, whilst the Airport electoral division is considered 'affluent' (6th least deprived rank) with a relative score of 13.1.

As shown in Figure 7-3, all Small Areas which make up the Airport Electoral Division are classified by the Irish Deprivation Index as 'affluent'. Several Small Areas surround Dublin Airport are classified as 'marginally below average' and 'disadvantaged', this includes the neighbouring settlement of St Margaret's.

North of Dublin airport is the settlement of Swords which contains four Small Areas which are classified as 'disadvantaged' and seventeen which are classified as 'marginally below average'. West of Dublin is the settlement of Malahide which is classified as a mix of 'marginally above average', 'affluent' and 'very affluent'.